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Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

Telephone—Bryant 2576.

CABLE ADDRESS: IRWORLD, NEW YORK

HENRY C. PEARSON, F.R.G.S., Editor

Vol. 65

MARCH 1, 1922

No. 6

SUBSCRIPTION: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft, Post Office or Express Money Order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

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Dollar Rubber Again?

IN another column Arthur W. Stedman, who is perhaps the dean of crude rubber factors, cites the offer of an English producer to contract to sell his futures for five years for 50 cents a pound. At first blush this would seem to indicate a long continuance of the present low prices for crude rubber. But does it? To cite a single case. In 1905 the managing director of Highlands and Lowlands was lunching with the Editor at the Singapore Club. He then stated that a guarantee of 75 cents a pound would secure their whole product for five years. Before the end of that period he got as high as \$1.80 a pound, and in years following considerably more. One wonders therefore if history is to repeat itself.

As matters stand the production of crude rubber is lessening. This is partly due to voluntary restriction, and partly to a lack of profit. There is, moreover, the possibility of a very great shrinkage in production when

the present upkeep of estates is interfered with. The Hevea is a voracious surface feeder. In its wild state it stands amidst deep mats of rotting vegetation. It is also inundated by waters rich in river mud. In the plantation, however, the ground is clean, and to keep up the product the trees must be frequently fertilized. Again the tree is tender and subject to hosts of insect pests, bark, root and leaf diseases. In its wild state the trees stand far apart with leafy barriers of trees and vines to isolate them. In the plantation, however, disease once started spreads like wildfire. So far these conditions have been successfully met because there has been a big profit in rubber and almost any cost was warranted in safeguarding the crop. But with vanishing profits no such care and effort will be possible. The result will be lessened production per tree because of lack of food, and destruction of large areas because of lack of funds necessary to stamp out disease. One has only to hark back to the time when Ceylon grew lots of coffee, and to the later time when disease wiped it out.

There is, moreover, another reason for higher prices sometime. And that is the gradual expansion of the rubber business itself. With rubber high, many substitutes for manufactured rubber crept into the market. None of them were as plastic, as durable, as satisfactory as rubber but they were cheaper. Today rubber is cheaper than any of them and is slowly replacing many. The future therefore promises lessened production of crude and increased production of manufactured goods.

Cheap Rubber Goods from China

THE world has long speculated on what might come to pass were the sleeping Chinese "giant" to awake. That there was a probability of the ancient nation with its hundreds of millions of cheap laborers unifying its forces in the near future and exerting a far-reaching influence in the commercial world, has been conceded. Coming events do not always cast their shadows before, nor does history always repeat itself to put us on our guard. It is a fact that China may suddenly develop into one of the most formidable of all competitors for the American trade. Commercial adventurers are even now moving heaven and earth to get the indorsement of Congress for a scheme, which if carried out as planned may utterly ruin many of the most flourishing industries in the United States and cause unemployment here to reach alarming proportions.

The scheme—ostensibly for the relief of "poor China"—contemplates the organization on a colossal scale of cheap Chinese labor under cover of American law in China and immune from American or Chinese tax collection. But that it is fraught with grave peril for American industries is only too obvious. Representatives of the New York garment trade declare that if such legislation as the Dyer bill be enacted into law it could quickly make Shanghai the ready-to-wear center of the

world, and that cheap coolie labor under massed production could put the American garment makers out of business in six weeks. No tariff impost, however high it might be, could control such competition. If the ready-made clothing trade were to be so seriously affected, would the trade in other rubber goods fare any better? The chances are, were such legislation effected, the manufacture of rubber goods would also be undertaken in China on a large scale. And with such an initial advantage, coupled with nearness to the rubber plantations and the installation of up-to-date machinery, countless workers at beggarly wages would soon be turning out rubber goods at prices that no American manufacturer could hope to meet. And pirating of standard trade-marks could also be expected.

Publicity may help to prevent such an attack on American industry, but to kill the scheme outright there must be a direct, prompt, concentrated, and insistent demand made upon Congress by the rubber and other manufacturers of the country.

Using Governmental Bureaus

HARDLY anything is more discouraging to a rubber manufacturer than to spend many months, and often thousands of dollars and a great deal of his employes' time, in working out a process or in perfecting an article in the hope that it would prove original and valuable, only to find that he has been anticipated by some ingenious and enterprising rival. Or it may be that a manufacturer has hit upon what he believes to be a unique labor-saving arrangement in his plant, and he expends much time and money in working out details, only to discover that the scheme is not original at all, and not only had been in operation in another factory, but, after a fair trial, had been discarded as useless.

It is well not to attach too much importance to any such ideas until one finds out first what has been done already in the country or the world in the same or a similar direction. Among the best aids to concerns striving to improve methods of manufacture and marketing are the Bureau of Standards—called the world's greatest scientific laboratory—and the Bureau of Foreign and Domestic Commerce at Washington. These and other government agencies are only too willing to share with manufacturers their own rich accumulation of data and statistics, as well as obtain for them special information on any subject of practical value. At no cost a factory manager may thus learn what the expensive experience of others has been in various phases of production; even as a sales chief may readily find out how, when, and where others have disposed of their wares to the best advantage. There is scarcely an industry in the country that may not be aided in some way by these useful

federal bodies; and inquirers may seek and obtain advice without arousing even the slightest curiosity on the part of rivals.

Low Prices and Tire Repairs

EVEN a good wind may blow somebody ill. While a multitude of motorists are rejoicing over radical reduction in the prices of tires, complaint is heard from the better class of retreaders throughout the country that the price-cut has hit their business a serious blow. So cheap have even the best of casings become—some being listed at even less than pre-war prices, and practically all of them carrying much more mileage than ever before—that many motorists now buy new tires instead of having worn tires retreaded, as the difference in cost is but slight. The plight in which the retreaders find themselves is one which doubtless will be moderated with the next change in tire prices which should be upward if seasonal records run true to form.

Evidently the logical course for the retreaders to pursue would be to cut prices to hold old business and to win new trade as the tire makers have done. Many contend that they cannot do this, and that their charges have already been lowered to the "irreducible minimum." Even though they can get retread stock 10 per cent cheaper than a few months ago, labor is unyielding and other costs are difficult to lessen. A solution of that problem may be found in the introduction of more efficient equipment and processes. It would pay many a retreader to scrap all his old apparatus and wholly revise his methods. Thus not only could he hold his own against the lower tire prices but he would put himself in a position to get more profit on his work when tire prices go up again.

STUDENTS AT WELLESLEY COLLEGE HAVE BEEN warned by the college physician not to go out of doors bareheaded on cold rainy days. Thus colds are to be avoided. To the masculine observer the thin soles worn by modern women are a greater source of danger. Rubber soles or footholds are better cold preventives than scarfs, hats, or hoods.

TIRE-MAKERS IN GERMANY RECEIVE THREE DOLLARS weekly; in the United States tire makers receive fifty dollars a week. The same low wages are paid all skilled workers in Germany and similar high wages in America. Is this not a sufficient argument for valuation of imports or at least duties adjusted to meet low labor costs and depreciated marks?

AT A TIME WHEN ADDITIONAL USES FOR RUBBER ARE being sought, the decision of Guatemala to substitute porcelain tokens for those of hard rubber is discouraging. It may not show in statistics but the principle is bad.

Making Hard Rubber Goods from Hard Rubber Dust

The Manufacture of Hard Rubber Products
Is a Specialized Industry Requiring Experience
and Technical Knowledge of a High Order

By William S. Cobb, Mechanical and Efficiency Engineer

The Telephone Receiver

IN a vast and important enterprise such as the telephone industry, rubber is one of the most essential materials used in the construction of transmission equipment. Its significance is more clearly visualized by the fact that there are now more than 13,000,000 Bell telephones in the United States and Canada. The hard rubber telephone receiver shown in Fig. 1 is therefore of particular interest. The process of making the hard rubber units of this instrument are similar except that different dies and molds are employed. Therefore, a brief outline will be given of the procedure necessary in making a telephone receiver cap. This is shown, detached from the receiver, in Fig. 1.

Making hard rubber goods from hard rubber dust is comparatively a new process and one which has become very important in the hard rubber industry. Hard rubber scrap such as combs, fountain pens, syringe barrels, pipes, meter pistons, disks, balls, etc., which were at one time relegated to the scrap pile, are now a valuable source of raw material from which the dust used in the manufacture of a great variety of hard rubber goods is made.¹ A unit where telephone receivers are made in a hard rubber factory is shown in Fig. 2.

The Receiver Cap

A telephone receiver cap is shown in Figs. 1 and 3. The threaded portion, and the upper surface are finished by dies. The hole is not made by the dies but is drilled, the edge of the rim being turned to the required diameter and shape in the lathe.

Making the Dies

For the molding of the cap, owing to its large diameter, a set of seven dies and ring has been decided on as being the maximum size and weight that can be conveniently handled by the operator. Fig. 3 shows a set of dies and ring.

The dies are made from a good grade of hard drawn bar brass that is free from seams, holes, etc. Brass is used because it is easily tooled, takes a high polish, holds its shape very well, and does not corrode, all of which are essential in producing this class of goods.

The blanks are cut to length from a bar of the desired diameter, an allowance of about 1/16-inch being ample for finishing in each case. They are mounted in the lathe chuck, one end faced, hole drilled and tapped for the stud on which they are to be finished, the other end is then rough-turned to near the desired shape and size.

For giving the shape and size to the dies, a set of master templates and gages is provided, as shown in Fig. 3. These are made as accurately as possible to the drawing or sample, and an allowance for shrinkage is made to compensate for the

shrinkage that takes place in the rubber. This shrinkage, while slight, must be provided for; otherwise the cap will not give the desired fit.

Profile cutters, having the exact shape of the master templates, are used for finishing the dies; these cutters are held in an arbor which is fitted to the taper hole in tail stock sleeve. Figs. 3 and 5 show templates, gages, cutters and holders. In making the threaded or lower die, care must be taken that the threads have the correct angle, are smooth and polished, and a slight taper given to the thread diameter. This allows the cap to be easily removed from the die without tearing the thread, which defect would cause it to be rejected by the inspector.

After tooling, all surfaces are given a high polish, care being taken that there are no scratches left on the finished surfaces of the dies as every mark, no matter how slight, will show on the cap.

Referring to Fig. 3, it will be seen that the receiver cap is quite thin around the hole in center, and at this point the dies will come close to each other and are liable to be damaged when pressure is applied. To overcome this a depression is made in the top surface of the lower die, slightly larger in diameter than the projecting center of the upper die; this will produce a button of increased thickness which may be removed when the hole is drilled.

Around the outer diameter of both the upper and lower dies there is a projecting rim; this is to protect the corner of the die and prevent the rubber from flowing between the die and ring, and also indicates, when being turned, where the curve of the rim terminates. The corners of upper and lower dies are rounded to prevent upsetting when in use.

Making the Ring

The ring is made of forged steel 9¼ inches in diameter and 2¼ inches thick, faces turned smooth and parallel with each other, and the diameter turned and corners slightly rounded. The holes are laid out to the desired spacing and drilled to a convenient size in the drill press, then mounted on the face plate of lathe and bored to the proper size. Walls of the holes must be made very smooth which may be done with a lead lap and emery powder on the drill press. When finished the holes should be slightly larger at the top than at the bottom to allow the dies and cap to be easily removed from the ring.

After the dies are fitted to the ring, they are numbered so that the dies may always be used in the holes to which they were fitted. The ring is then subjected to a heat treatment process to prevent corrosion.

¹See "The Manufacture of Hard Rubber Dust," THE INDIA RUBBER WORLD, December 1, 1921, pages 169-170.

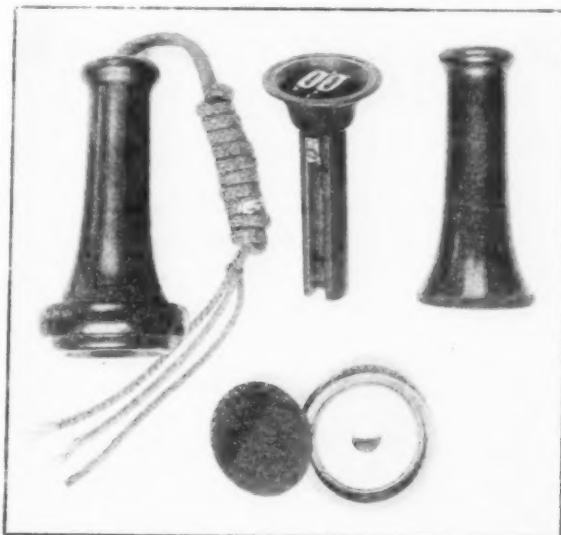


Fig. 1. Telephone Receiver Assembled and Unassembled

Where the production is large and constant, several sets of dies are provided for each operator, part of them being charged with dust while others are in the presses.

The Press Vulcanizer

The hydraulic press used for vulcanizing or curing is of the single-opening type, Fig. 4, fitted with plates through which water is circulated for cooling purposes. The presses are installed in units of four, mounted on a frame of suitable height to clear the floor, and with a pan underneath to catch the water from the presses. High and low water connections are made, the latter with the city supply main and the former with the hydraulic accumulator which should give a pressure of about 3200 pounds to the square inch.

Die Charging Cups

After a cap has been made to the desired specifications, a means for quickly and accurately determining the exact quantity of dust that each die will require must be provided. This may be done by weighing on the scales or with a set of cups, each holding the exact quantity required. The

in the press vulcanizer, one at the bottom and one at the top of dies. The ram is raised by the low pressure water system and as the die is heated the accumulator pressure is gradually applied and allowed to remain during the time required for curing and cooling.

Removing the Cap

After each die is removed from the ring the top die is loosened from its cap by tapping lightly with a mallet. For removing the cap from lower or threaded die, a chuck and wrench are provided. The chuck is made of cast iron bored to fit the diameter of the lower die, and secured to a sheet steel base with machine screws. A saw cut is made through the center, and opposite sides are flattened for holding in the vise. The wrench is made of forged steel bored to fit the diameter of cap flange and the edge is serrated to insure proper grip. These are shown in Figs. 5 and 6. The die is placed in the chuck, clamped between the vise jaws, and

the cap removed by gripping the rim with the wrench and unscrewing. It is then inspected for surface defects.

In Fig. 6, two dies and a portion of the steel ring are shown

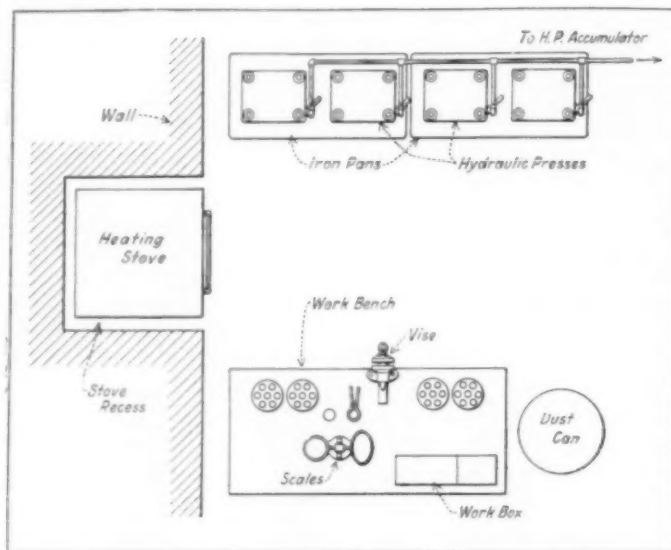


Fig. 2. Factory Unit for Making Receiver Caps

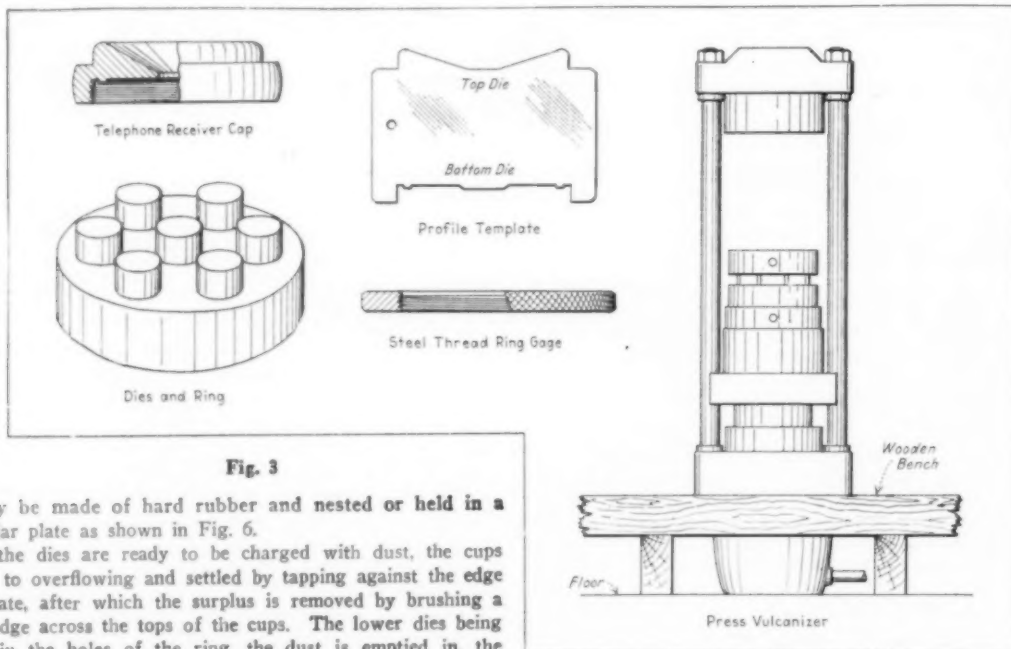


Fig. 3

cups may be made of hard rubber and nested or held in a flat circular plate as shown in Fig. 6.

When the dies are ready to be charged with dust, the cups are filled to overflowing and settled by tapping against the edge of the plate, after which the surplus is removed by brushing a straight edge across the tops of the cups. The lower dies being in place in the holes of the ring, the dust is emptied in, the top dies entered, and the set is ready to be placed in the press.

The necessary heat is supplied to the dies through cast-iron plates whose faces are smooth and parallel with each other. These are heated in the stove to required temperature and placed

in section and will illustrate the comparative volume of dust before and after vulcanizing.

Fig. 4

Telephone receiver caps are but one of a great number of the articles that can be made from hard rubber dust, and if the dust is properly prepared the surfaces produced are smooth and highly polished and require very little labor to finish. Extra care must be taken that no foreign substances, such as small pieces of metal, filings, etc., get in the dust, as they will scratch the dies and re-

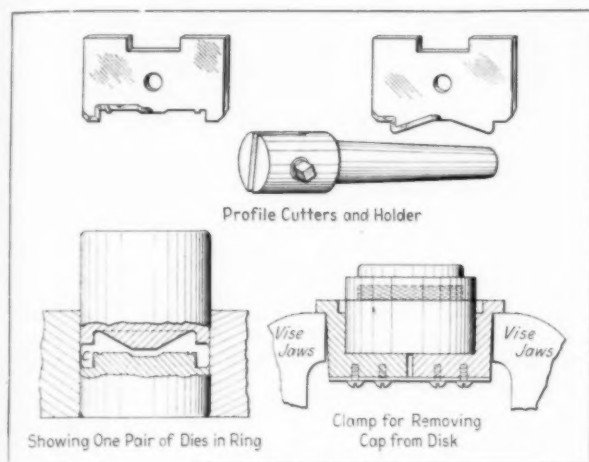


Fig. 5

quire repolishing, or the dies may be damaged to such an extent that it will be necessary to resurface them.

Finishing the Caps

Drilling the hole and turning the rim edge are done in the lathe; a threaded stud or chuck is attached to the lathe spindle and the cap screwed thereon. A flat drill is used for drilling the hole, as it is easily and cheaply made and can be tempered

the flange diameter and also the height of cap. The gages marked "go" should enter or pass over, and the "not go" should not enter or pass over.

The gage tolerances are determined by the designing engineer, and work made within the limits will fit the part for which it was designed, even though the work is made by several manufacturers.

Master gages should receive the best of care in handling and using, and should be used only for test checking. Gages for shop use may be made by the manufacturer within the limits of the master gages, and used for inspecting and checking the work going through the factory.

AN AUTOMOBILE TIRE PROPHECY

Just as it has been remarked that great rivers always chance to flow alongside a great cities, the popular impression is that when the motor car, a little over a quarter of a century ago, started to radically revolutionize transportation, the pneumatic tire, by a curious coincidence, appeared almost providentially just at the same time to make possible the wonderful work of the automobile. But as matter of fact the two did not make their debut together. The pneumatic tire was the forerunner by several years of the "benzine buggy"; and, strangely enough, the pneumatic tire not only made modern motoring possible, but its value for such a requirement was clearly indicated much in advance of the automobile. As early as April 15, 1894, Kirk Brown, now president of the Condensite Company of America, made a statement in THE INDIA RUBBER WORLD which, in the light of subsequent developments, was little less than a prophecy.

"The pneumatic tire has only to be known to be widely used," said Mr. Brown. "It will be used on practically all classes of vehicles; it will be deemed as necessary as springs. In 2,000 to 5,000-mile trips without mishap the pneumatic-tired bicycle has answered the objection of cutting most often urged against such tires. The truth is that a puncture is not as liable to happen as the breaking of an axle or other disabling accident." So, too, Mr. Brown was

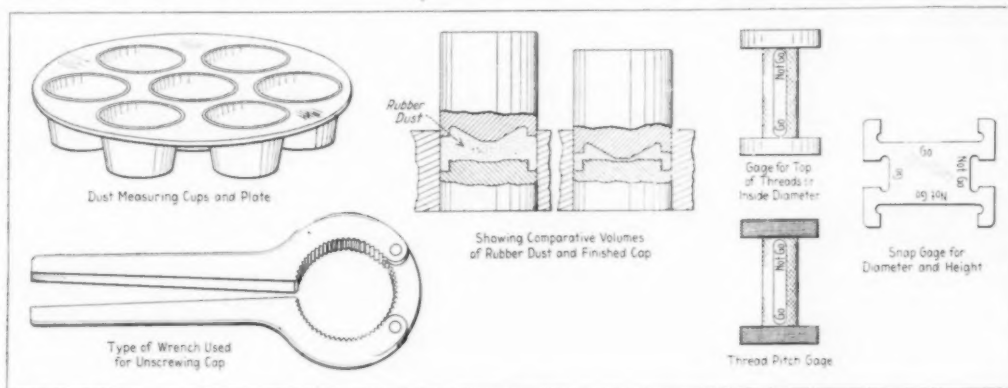


Fig. 6

very hard, which is necessary because the rubber soon dulls the cutting edge.

The edge of the rim is turned to the desired diameter and shape, after which it is polished. When an inscription is to be put on the rim, it is done with a circular stamping wheel on which the inscription has been engraved.

Inspection Gages

The final inspection is then made for surface finish, dimensions, etc. For this purpose a set of gages as shown in Fig. 6 is used. These are made of steel, hardened and ground, and should be stamped with title, size, etc., for gaging the inside or top diameter of the threads; for pitch or thread diameter; and for

among the first to point out the advantages of the pneumatic tire, especially its remarkable power to absorb vibration, its wonderful speed-accelerating quality, the essential construction of "air sac and protective covering," the importance of proper proportion of tires to load, and ease of removal and rigid fastenings; just as he forecast the evolution, too, of a tire that would be quite as slightly as it would be eminently efficient.

STOCKHOLDERS OF THE AJAX RUBBER CO., INC., HAVE APPROVED the issuance of \$3,000,000 first mortgage fifteen-year 8 per cent bonds and also a change in the present capital stock from 400,000 shares of \$50 par value to 500,000 shares of no par value.

A Glossary of Words and Terms Used in the Rubber Industry—XII¹

Pneumatic Tires—Additional Definitions²

By Henry C. Pearson

ACCESSORIES (AUTOMOBILE). Articles of rubber that form part of the equipment of an automobile. They include tires, inner tubes, insulated wire, battery parts, mats, tops, buffers, weather strips, windshield cleaners, fan belts, pedal rubbers, radiator, pump, and gasoline hose, brake and clutch lining, tire accessories in general, and automobile clothing.

ACCESSORIES (BICYCLE AND MOTORCYCLE). Articles of rubber that form a part of the equipment of the vehicles named. They include tires, tubes, tire accessories, repair kits, insulated wire, batteries, lamp covers, pedal covers, etc.

ACCESSORIES (TIRE). Articles added to or used with a pneumatic tire to repair or protect it, or in some way to aid it in functioning or to enhance its usefulness; various supplies supplementing stocks of tires and tubes carried by dealers; also a large range of articles used by tire repair men, as cements, patches, repair stocks, treads, liners, valve bases, boots, flaps, sleeves, armor, inner shoes, etc., etc.

ACID SPLICE. A union effected by applying to the cemented parts a cold cure solution. See Cold Cure.

AIRBAG. A part-circle, curved, tubular, heavy rubber or rubber and canvas bag with closed ends, one end fitted for inflation with a valve. It is clamped in a casing—to afford pressure in making or repairing, to the inner contour of which it readily conforms. A practically round bag is used in a clincher or quick-detachable tire, but in a straightside casing a bag with sloping sides and a straight base is preferred. Heat expands the confined air so that 50 pounds air pressure will afford 60 pounds curing pressure.

AIRBAG LEAK CEMENT. An emergency cement or filler for coating the interior of leaky or porous airbags consisting of vulcanizing cement alone, or a mixture of three parts of such cement with one part of soapstone, drawn into the bag after the air has been expelled. A less dependable solution is made with flaxseed or corn meal and water.

AIRBAG PADS. Pads used in vulcanizing molds to prevent airbags from overstretching and overheating and to afford better pressure. Often made from old tire carcasses in from one to three plies and usually three inches longer than a bag, and with half-inch steps at either side of the inner part of the pad. For airplane tires special pads are made of rubberized fabric with a broad outer arc to fit the vulcanizer cavity and a narrow inner arc to fit the casing.

AIR POCKET. A space between layers in a casing in which air has been trapped. See Blister.

ANGLE ENDS. The three-cornered triangle ends that are left when tire fabric is cut on the bias; utilized in repair by uniting the diagonal sides to form a continuous strip.

AUTO-PNEUS. A German trade term for pneumatic tires.

BAND PLY. The inside or base fabric layer in a carcass; the last or bottom ply in a stepped-out repair job. Being the innermost connecting layer of a casing, it is never cut out in a section job done on the outside of a tire; also called the locking ply in repairing, as it locks or holds the repair together.

BASE. The bead section of a tire or that part which rests on the rim.

BEAD BRAID. A braid used instead of a single wire or cable and made of many fine piano wires loosely interlaced, the mesh enabling the rubber in the bead core to unite firmly with the metal reinforcement.

BEAD CABLES. Strands of steel wire, twisted rope-like and inserted as reinforcement in a bead core. Often in continuous ring or grommet shape without brazed, welded, or soldered ends. See Bead.

BEAD FILLER. A hard rubber strip used for applying a straight-side tire to a quick-detachable rim to take the place of a clincher tire bead; also for applying a Q. D. clincher tire on a S. S. rim. See Rim Filler.

BEAD POCKET. The fabric-lined space in a bead into which is fitted the core. See Bead.

BEAD SETTING. The points at which the bead is placed on the tire; the setting of the bead on the tire. See Bead Tie-in.

BEAD WRAPPER. A light-gage coated duck used to wrap around the head to make it adhere to the fabric plies. See Flipper Strip.

BENZENE. A volatile, inflammable fluid obtained commercially from the destructive distillation of coal (chemical formula C_6H_6), and much used as a rubber thinner and solvent; commercially known as benzol (which see), it is much used instead of gasoline (which see); pure benzene has a specific gravity of .88 and boils at a constant temperature of 177 degrees F.; 90 per cent benzene (chemical formula benzol-toluol) has a specific gravity of .87 and boils at 248 degrees F.; is non-greasy, that is free from "high boiling residues." Also called coal-tar benzene. It differs from benzine (which see) in being a single hydrocarbon of constant composition, whereas benzine is a varying mixture of hydrocarbons.

BENZINE. A volatile, inflammable fluid distilled from petroleum (chemical formula varying, mixture of hydrocarbons), employed as a rubber thinner and solvent and in other ways; specific gravity .73 to .75; boils at from 248 to 302 degrees F.; is practically free from oily matter.

BENZOL. A volatile fluid obtained from coal tar and practically identical with benzene (which see). The term benzol is now confined chiefly to mixtures of benzene hydrocarbons, of which two varieties are much used as solvents and thinners of rubber (especially in Europe): "90 per cent benzol," which contains 70 per cent benzene, 24 per cent toluene, and 6 per cent xylene, carbon disulphide, and other substances; and "50 per cent benzol," containing somewhat more toluene and xylene, and but a trace of carbon disulphide.

BIAS. The angle at which tire fabric is cut.

BIAS-CUTTING. Cutting cord and square-woven fabric at an angle of 45 degrees, or diagonally, to the cords in cord fabric or the warp (lengthwise) threads in square-woven (regular or builder) fabric. It is done to allow all strands to bear their share of the strain on the carcass. See Bias Fabric.

BLEMISH. Any defect which shows in a tire after curing.

BRAIDED BEAD WIRE. Flat braided ribbon of steel wire used in the core of straightside tire beads.

BREAKER CUSHION. A strip of rubber of the same kind as the coating cement alone, or a mixture of three parts of such cement

BRUISE BLOWOUT. A fabric break due originally to a severe blow or bruise which weakens underlying layers in a carcass until the tube wedges itself into the weak spot and is finally cut by the sawing of the loosened fabric and explodes. See Blowout.

BUCKLING. (1) A tire manufacturing defect usually due to using friction and skim-coated fabric of plus gage in carcass building, which causes a casing to bulge unevenly in curing; (2) a trouble met with in repair vulcanizing and usually due to excess clamping or uneven padding in the retread mold or about the pressure bag or core on the inside of the casing; (3) a difficulty oc-

¹Continued from THE INDIA RUBBER WORLD, January 1, 1922, pages 263, 265.

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casionaly experienced with new airbags in tire manufacturing and repair in which the bags, made to fit perfect casings, fail to conform themselves to added plies or to expand uniformly in inflating.

BUILDING REPAIR. Setting a tire on a core or building mandrel, and, after removal of damaged material, inserting and cementing layers of plain or cord fabric, or cords, to replace the excised ply sections. See Building Up, Stepping Out, etc.

BUTTRESSED TIRE. A term applied to a tire having its side walls reinforced with extra rubber, usually in ring or corduroy pattern, to lessen curb wear, etc.

C. I. F. (COST, INSURANCE, FREIGHT). An abbreviation of a standard American export practice commercial term used in shipping tires, tubes, etc., and meaning that the price quoted covers the cost of the goods, marine insurance, and all freighting charges to an overseas port.

C. & F. (COST AND FREIGHT). An abbreviation of a standard American export practice commercial term used in shipping tires, tubes, etc., and meaning that the price quoted covers the cost of the goods and all charges for transporting the goods overseas.

CROSS WRAPPER. Narrow strips of fabric wrapped spirally around an inner tube on a pole before being cured.

DEAD FABRIC. Injured or deteriorated fabric.

DEFLECTION. A tire trouble showing itself in partial flattening of the casing and due primarily to insufficient inflation.

DETACHABLE FLANGE. A ring of spring steel fitting into a groove on the outer side of a straightside rim and forming one of the clamps for a straightside tire. See Rim.

DETERIORATION. Impairment in quality, value, etc., in vulcanized rubber as found in finished tube and casing products and shown in hardening, checking, cracking, and loss in tensile strength and elasticity.

DISTORTION. Change of the fabric construction due to stretching, either on application to the core, inflation on the rim, or service on the road.

DOUBLE TREADS. A trade term for tires renewed by vulcanizing a new tread band over the worn tread.

DRILL. A fabric with a twill weave wherein usually the warp is over two filler threads and under one.

DUCK. A general term used with reference to all builder fabric.

ENDLESS BEAD CORE. A bead ring made of one piece of wire without joint, the wire ends being fastened inside the finished ring so that they cannot be displaced.

ENDS. (1) The warp or threads run off the spool in weaving; (2) a term used in the tire industry in specifying the kind of fabric necessary for certain classes of work.

FABRIC TYPES. Various cotton weaves used in carcass construction, chiefly combed Egyptian, carded Egyptian, combed peeler, carded peeler, and combed Sea Island for 17½-ounce builder fabric; and combed Egyptian, combed peeler, carded peeler, and combed Sea Island for cord tire fabric.

FACTOR OF SAFETY. In tire construction, a figure representing an excess load above normal which a tire is designed to withstand, and expressing reserve strength.

Additional Definitions for Tire Fabrics

ELONGATION. An extension of a fabric in the direction of either the warp or the weft, due to straightening, stretching, or slipping of the fibers; an increase in the distance between parallel threads in a weave, due to actual strain upon the yarn or alteration in crimp (or regain). Such alteration may be due to unequal tension in warp and weft, lessening the crimp in one and increasing it in the other; by a change in the number of threads per unit length; or by such flattening of the threads by compression under tension as to alter the crimp in either warp and weft, which should be even in builder fabric of correct construction. See Builder Fabric, Crimp, Fabric.

STRENGTH. Resistance to breaking while under strain. The paramount requirement in the cotton fabric used in tire construction, the degree of which is determined in weaving mills usually by instruments, in various ways.

Breaker Fabric (Uncoated). Strength in breaker fabric varies more than in builder fabric, due to a greater diversity in weaves. A much-used fabric of plain, or mock leno weave, weighing 10 ounces to the square yard and having 12 ends and 13 picks per inch, has an average breaking strength as follows:

Breaker Fabric Material	Warp Pounds	Filling Pounds
Sea Island	160	180
Combed Egyptian	140	155
Carded Egyptian	115	130

Builder Fabric (Uncoated). According to one method of testing tensile strength, a piece of square-woven builder fabric, 17½ ounces to the square yard, 11-ply yarn, unraveled down to one inch, which shows in number of threads the exact texture of the inch exposed, is placed in the jaws of the tensile strength testing machine and compared with the following standards obtained in the same manner:

Builder Fabric Material	Warp Pounds	Filling Pounds
Sakellarides	340	360
Sea Island	319	320
Combed Egyptian	275	285
Carded Egyptian	260	270

The explanation given for the greater strength shown by the warp over the filling (weft) is that the warp is woven under greater tension. Individual test results on warp and filling should be not more than 5 per cent tolerance below the specified tensile strength, according to the tolerance adopted by the American Society for Testing Materials. The average tensile strength of warp and filling together, as found by test, should be not less than the specified tensile strength. See Tolerance, A. S. T. M.

Chafing Fabric (Uncoated). Strength in chafing fabric is relatively lower than in builder or breaker fabric on account of its lighter texture, it being made especially flexible for use on tire sidewalls. The fabric, of plain weave, weighing 9 ounces to the square yard, yarns 4/22.5 or 4/23, gage .022, and with 34 ends and 34 picks to the inch, has a breaking strength as follows:

Chafing Fabric Material	Warp Pounds	Filling Pounds
Sea Island	155	170
Combed Egyptian	125	140

TEXTURE. The lay-out of threads in a fabric, or the manner in which they are interwoven, referring largely to the openness or closeness of the weave. In plain or square-woven builder fabric the texture is usually 23 ends (warp) and 23 picks (weft) per square inch; in breaker fabric it is much lower (varying with manufacture), being lower in leno than in square-woven breaker; and in chafing fabric there are usually 34 ends and 34 picks. According to A. S. T. M. standards, the number of ends should be not more than .02 over nor .04 under the specified count, and not more than one pick over or under the filler.

THICKNESS. Measure of material between opposite surfaces; gage, as of tire fabrics, determined with apparatus in inch fractions. Cord fabric averages .033-inch gage; plain or square-woven builder fabric is usually made in .036-inch to .040-inch gage; breaker fabric .042-inch, and chafing fabric .022-inch. According to A. S. T. M. standards individual measurements of gage shall vary not more than .005-inch under or over specified thickness, and average thickness determined by test shall vary not more than .002-inch under nor .003-inch over specified thickness.

TWIST. The union (in cotton manufacture) of several threads or strands into one by spirally twining one about another. Tests of twist (in tire fabric making) are made as to the number of primary threads coiled, quality of each, uniformity in twisting, etc., with various instruments. Cotton fiber possesses twist or

torsion in a high degree, the filaments bending freely about and clinging closely to one another. In builder fabric the twist in the single yarn is from 14 to 16, and in the ply yarn it is 4 to 5 turns per inch.

WEIGHT. Heaviness in proportion to bulk. In tire fabrics weight is determined of ounces per square yard, varying with thickness, texture, moisture content, etc. Cord fabric averages $14\frac{3}{4}$ ounces to the square yard; plain or square-woven builder fabric weighs approximately $17\frac{3}{4}$ ounces per square yard; breaker fabric averages 10 ounces per square yard; chafing fabric about 9 ounces per square yard. The weight of fabric determined by test should be not more than 1.5 per cent under nor more than 3 per cent over the specified weight, according to American Society for Testing Materials standards. See A. S. T. M.

The Crude Rubber Market in Review

By Arthur W. Stedman

Looking back over 30 years in the rubber trade and comparing the business of that time with the present, it is interesting to note the enormous increase in rubber products of all kinds. Fortunately the supply of crude rubber has kept pace with the production, otherwise through scarcity and prohibitively high prices, we would not have arrived at the present immense volume of business in automobiles and other industries employing rubber.

Thirty years ago the world depended upon 35,000 to 40,000 tons of wild rubber produced by Brazil, Mexico and other tropical countries. The number of grades and qualities ran into the hundreds, and a man had of necessity to know his trade which required years of diligence and patient endeavor. During this period pneumatic tires were unknown, and the large consumers were the boot and shoe manufacturers who took 60 to 65 per cent of the imports.

It is interesting to note in this connection, that the center of the trade at that time was Boston, from the fact that the majority of the boot and shoe factories were located there, and as the jobbers from all over the country visited Boston semi-annually to buy leather shoes, the sales offices of the rubber shoe factories were located in that city, and the principal sales of crude rubber were made there.

In those days, due to the narrowness of the market, it was not unusual for the price of crude rubber to advance several cents a pound upon the occurrence of a snow storm, the advance depending upon its severity. The number of crude rubber importers could be counted on the fingers of one hand, and the number of manufacturers was in like proportion. Between them there was a spirit of confidence and friendship quite impossible to comprehend at the present time. There was no such thing as the passing of a sale contract. Purchases and sales, often for large quantities, were made and the invoice was the first paper passed. Business was done on honor, and it was never betrayed.

Until the introduction of chemistry into compounding, rubber goods were made by the "rule of thumb" and a compound once found to be satisfactory when certain rubbers had been employed was never changed. If because of shortage the price of a certain rubber rose above the relative value of Pará rubber, it made no difference. If caucho slab was specified in that compound it was bought, never mind what it cost.

In the early days islands fine was the standard of values, the price of which set the price of all other grades including the mediums. Later this was changed and upriver—or Manáos—fine became the standard, as ribbed smoked sheets is today. The normal price for fine Pará ruled for many years at from 65 to 85 cents and it remained at this level excepting when occasional attempts were made to corner the supply—which never succeeded in the end, causing an artificial market.

During the years 1899-1900, Baron Gondoriz attempted to

corner Pará rubber, and fine Pará touched 98 cents. During the months of the corner, the manufacturers used every endeavor to resist it. They used medium grades, which had also advanced in sympathy with Pará, and restricted their consumption of rubber to a minimum. This continued for several months, finally resulting in such accumulation held for Gondoriz that he reached the end of his finances and his stock was closed out. Shortly before the break, the American manufacturers got together and offered 90 cents a pound for Gondoriz' entire holdings, but he held for \$1 which was never reached. When the break came prices declined rapidly, fine Pará reaching the record price of 50 cents, but the market quickly reacted on buying of consumers both in the United States and Europe to replenish their stocks which they had allowed to run down to the last scrap.

The advent of plantation rubber worked a great change in the crude rubber industry. At first it did not meet with favor from the manufacturers, and it was a long time before they learned to use it. The early product was not well prepared, much of the latex was from young trees, and weak. The old-time methods of manufacture failed to produce satisfactory results, but the consuming demand increased so rapidly that the manufacturers found themselves compelled to change compounds and to learn to use plantation rubber.

The demand for crude rubber increased so rapidly that by the end of 1910 a real shortage became imminent, and a \$5 market was freely predicted, large sales were made at \$3 a pound from which point the market continued to advance and considerable rubber changed hands up to the record price of \$3.26 a pound for ribbed smoked sheets. Fabulous dividends were paid by the plantation companies, and rubber planting increased by "leaps and bounds."

During the late war the Government put a maximum price of 62 cents on ribbed smoked sheets and restricted the quantity of imports, resulting in a large accumulation of stocks in the Far East.

After the Armistice was declared and unrestricted shipments were permitted, a large number of vessels made haste to obtain the high rates for freight then ruling for Far East to New York and the Pacific Coast. This resulted in the arrival of larger supplies than the market could digest, and the price, too, was driven down 37 cents, the lowest point touched up to that time. The consumption, however, was so large and stocks in consumers' hands so small that the surplus stock was soon absorbed and prices returned to more normal figures.

The prices ruling during 1921 were not caused by overproduction of rubber, but because of the general stagnation in business throughout the world. Consumption dropped suddenly to a low ebb, while production was not restricted until prices became unprofitable, which in time resulted in curtailing production to 60 or 65 per cent of normal, but stocks of rubber continued to increase and the law of supply and demand drove them to a new low level which was experienced last summer.

The market recently has taken a new lease of life. The general improvement in business is shared by the rubber trade which is reflected in the improved prices, but I do not expect ever again to see the same level of prices as formerly. While in London last July, the manager of one of the oldest plantation companies told me that they never again desired the return to prices which would tempt additional planting as there was an abundance already to take care of present and future demands, and said he would contract for five years for their several millions of pounds annually, if he could find buyers at 50 cents a pound.

In these 30 odd years the conduct of the London market has changed very little. There are of course a few more firms, not counting the plantation companies, engaged in the business, but a very few additions have been made as compared with the New York market. The same old names are in evidence and many of the same faces are seen as one passes through Mincing Lane.

Factory Costs Can Be Reduced by Time Studies Made by Experts Carefully Trained in Production Analysis

ORIGINALLY, time studies were employed solely for determining a standard production to be used as a basis for setting piece rates for workmen. Many people consider that time study consists of measuring the overall time needed to perform an operation. This is now understood to be wrong, but it is easy to see how the incorrect idea was obtained.

tion, and in that way to show how the production of the individual can be increased by other than slave-driving methods. This of course results in reduced costs. It is in fact, perhaps one of the most effective methods of reducing costs which the factory manager has at his command.

In order to get the information for setting a just standard and for improving the methods, it is necessary to get away from the idea that an overall time study is of value. Every operation, such as finishing a tire, is made up of anywhere from 2 to 100 or more individual performances. If the time-study man is careful to break up the performance of the workman, he will be able to list these individual performances and set down the time required for each. It is preferable to use the term "performance" in this connection, because of its expressiveness, although some engineers refer to the same thing as the "elements" of an operation.

Elementary Performances

This faulty method of taking overall time studies of an operation persists strangely, especially in plants where the time study is primarily used for the setting of piece rates. It is this overall time study method which is the cause of the seemingly unexplained fact that with six men performing the same operation, one or two of them will be very much more rapid than the others. If the performance of each of these men is more carefully studied than is possible with an overall time study, the reason will usually be found in the fact that no two of the men perform the operation in exactly the same way. The high

When the study of a complete operation is broken up into its elementary performance times, each of these performances is subject to study by itself, and it may be scrutinized to make sure that it is necessary to the whole operation, and that it is being done in the best way and the shortest time. Such information is hidden when only an overall study of the complete operation is made. In one instance—an operation made up of seven performances—several dozen men in the factory were engaged upon the

[illegible]

Study No. 107

same operation. Studies of two of the best of them showed an overall time of 94 seconds in each case. This, on the surface, would indicate that both men who are known to be good workmen, were performing the operation in the best possible way. However, when itemized studies were made of both, with the operation divided into its performances, it was discovered that one of the men was very rapid on the first and last performance, but slow on the intermediate five operations. The other man

¹Miller, Franklin, Basset & Co., New York, N. Y.

however, was slow and clumsy on the first and seventh performances, but very skillful on the other five. It was a mere coincidence that what one gained the other lost, thus making the overall time the same for both. The best methods of both men were standardized and a standard time obtained for the operation of 42 seconds, or somewhat less than half of the time which overall study would have indicated to be standard.

Breaking up the times into their elements has another advantage in that when a quantity possible to taken on, it is frequently possible to predetermine synthetically a standard of production without waiting until the operation is actually performed and then time-studying it. In one branch of the garment industry, for example, there are more than 3000 elementary performances.

Standards of production were set for each of these elements, and now whenever a new style of suit or cloak is designed it is possible to build up from the elementary times a correct standard of production. This has also been done in many other industries; it is in fact applicable to any industry.

Tire Factory Time Studies

The time studies herein cited are only a few of many which were taken in a rubber tire factory. It is worthy of note that the possibility of making these savings was originally suggested by a study of the reports developed by this concern's modern cost-accounting system. These reports indicated that the production of the tire department was only about half what it should be, despite the fact that the existing standards of production had been accepted as correct for fifteen years or more—ever since the concern had started to make tires. The management, however, basing its decision upon the information given by the cost system, decided to make a few test time studies of the tire makers. As a result, complete time studies were made of all operations in the tire department which showed the advisability of rearranging the department and making production easier. The complete study exhibited many causes for the men losing time, and also showed the possibility of standardizing the methods of performing each operation. Finally, they set new standards which enabled a fair set of piece rates to be installed. Production immediately began to increase and in a short time was actually double what had ever been obtained before. The men made higher wages and the cost per tire dropped about 22 per cent. These figures are for the entire tire making department. Now consider some of the actual time studies that were taken, which resulted in savings.

Ordinarily, in time, studying an operation, at least ten readings are taken of the complete operation as a basis upon which to set standards. It is hardly within the scope of this article to discuss the technique of standard setting, for it is quite complicated. However, it may be of interest to know that the first

step is to eliminate all of the unnecessary performances in an operation, as well as those delays which can be done away with. The standard as set for any performance is not necessarily the average of all ten of the observations. On the other hand, those readings which are far above or below the general run of the readings are ordinarily eliminated. Then take as the standard

the average of those readings which remain. Sometimes, however, the time-study man will see the reason why the time of a performance is too high, and in that event the standard may be taken at considerably less than the observed average time. It is well to bear in mind that the standard to be set from time study is that time which will be taken by a skilled and conscientious workman working under the best possible conditions

Study No. 75—Sheet A

Study No. 75—Sheet B

and according to the most approved methods of production.

The time studies shown in this article do not show ten complete readings, as the points to be exemplified are apparent from fewer readings.

Tire Building Studies

Notice time study No. 56 on the finishing operation of 33 by 4½ cord tires. Note that at the left of the sheet the time study man has listed the performances in the order in which the finisher performs them. Also note that in three instances, marked with a cross, there is an item "Delay—wait for tool." The total duration of the delays shown on that sheet is 2.29 minutes. This is not a complete study, as there were several other performances shown on a second sheet, but the total tool delays for the study amounted to 6½ minutes. Since the total allowed working time for one tire was 34 minutes, this waste amounts to nearly 20 per cent. This lost time obviously can be done away with by supplying sufficient tools. Therefore, it could not be allowed in setting the standard production for this operation. The management lost no time in supplying the needed tools.

Somewhat similar is the waste shown on time study No. 35, the building operation on 35 by 5 cord tires. Here the delay was due to the operator crossing the room to obtain the bead-placing ring. The allowed time for building the tire was 18 minutes and the time lost in getting the bead-placing ring was 1.82 minutes or about 10 per cent of the total building time. This time study showed plainly the need for each machine having two rings. When the study was taken, there were but three rings for two machines and these machines were on opposite sides of the room. When the magnitude of the loss was discovered, the proper supply of rings was provided.

In study 107, the finishing operation on 36 by 6 cord tires was delayed in the second performance due to the time taken by the workman in looking for material in various racks. In the first time taken the delay was 60 seconds. On the second, it was 5.09 minutes. Altogether, in the complete study of this

operation, there was $8\frac{1}{2}$ minutes lost time due to the difficulty the workmen had in finding the needed material. Since the allowed working time for the part was 70 minutes, the delay amounted to about 11 per cent. This material was stored in racks which were not marked, therefore the operator had to go to each rack until he found the material needed. The management was at fault in not having the material racks properly marked, so that such delays would not be necessary.

In study 75, two men worked as a gang in the stripping operation on a 30 by $3\frac{1}{2}$ cord tire. In this operation considerable time can be lost in building up the core if the core boards are not marked clearly or if the parts are laid out carelessly on the floor when stopping. When two men work together, the time study will frequently show the possibility of materially reducing the time by developing team work. In this case, the standard time which was set as a result of the time study was 2.45 minutes as against 4.47 minutes, which was the actual time as shown by the study. In this operation, it will be noted that man A and man B worked together until they got the four core pieces out, when A takes the tire and B builds up the core. Therefore, man A finishes long before man B and can help B, and also complete the first element on the next tire. It is thus seen that the first element should not be included in the allowed working time. The actual working time is shown on sheet A, and the allowed time as developed as a result of the study is seen on sheet B.

Practical Observations

In soapstoning fabric tires before vulcanizing, it was observed that a man could not be kept busy all day on the small number of tires he was handling. This job should not be rated under this condition of low production, to give the man a fair day's pay, because he is doing all those given him. In other words, it should not be done by figuring backward or by taking a fair day's pay and dividing it by the production to get the piece rate. This method is practiced in some shops.

If the production were about 170 tires per day of $9\frac{1}{2}$ hours and the task set at 50, this would allow about four minutes for every tire. The standard time allowed from time study was about two minutes, thereby cutting the time in half. This also cuts the direct labor cost in half.

The operative should be given another job to be done along with this during the day or some other satisfactory arrangement made suitable to local conditions.

In time and motion study work, it is often shown that a quicker method can be suggested. In a recent observation, a cord tire bead was being trimmed by placing the completed tire flat on a table, holding in one hand a board about 6 by 8 inches slightly under the bead. In the other hand was a knife, and as it trimmed the rough edge off the bead, it rested on the board. A method was suggested which cut the time in about half by using a "V"-knife and a wooden table with wooden sloping braces so that the tire could be handled very easily at any angle while being trimmed.

The studies that have resulted in savings which have been cited are not intended to cover anywhere near the field of time study in a rubber factory. They are, however, quite typical, and show that increases of production are frequently indicated by time studies taken in the correct way.

Lest, however, a manufacturer should be impressed with the possibilities of time study work in reducing his costs, and precipitately purchase a stop-watch, and give it to some inexperienced man in his plant, it should be made quite plain that such a method of procedure stands an excellent chance of being disastrous. The time-study man occupies a position requiring not only a certain degree of technical skill, but a very large share of tact and ability to get along with workmen. Workmen as a class are opposed to time study and suspicious of the stop-watch. This, however, is not a reason for the manufacturer to fail to benefit

by the result of proper time-study work, but it is an excellent reason why it should not be turned over to tactless and inexperienced employees.

The supervision of time-study work frequently encounters difficult conditions, such as opposition of the individual workman, or the organized resistance of labor unions. However, in the end, the workers' cooperation is usually enlisted, but sometimes only after a severe effort. Therefore, the statement is made that time-study work can be used practically always as a method of reducing costs, but with the reservation that it must be done by carefully trained and even more carefully chosen time-study men.

Judicial Decisions

COMBINATION RUBBER MANUFACTURING CO. vs. COURT OF COMMON PLEAS IN AND FOR ESSEX COUNTY. No. 20. Court of Errors and Appeals of New Jersey, September 23, 1921.

An appeal was recently made by the Combination Rubber Manufacturing Co., Bloomfield, New Jersey, from the decision of the Court of Common Pleas to the Supreme Court. The latter body, however, affirmed the opinion expressed by the Court of Common Pleas, and held that this verdict was justified, according to an amendment of the Workmen's Compensation Act of 1911. The case had reference to compensation for total disability awarded for loss of sole eye to a workman employed by the Combination Co.—*Atlantic Reporter*, Volume 115, No. 5, page 138.

Treasury Decisions

Protest (T. D. 38973 J.—G. A. 103016-8) of Hope Webbing Co., Providence, Rhode Island.

When, as in the present instance, webbing, elastic, neckties, garment trimmings, and similar materials have been manufactured with the use of imported artificial silk yarn, a manufacturing record must be kept which shall give details as to amount of artificial silk used, number of articles produced, etc. A sworn abstract from such manufacturing record must also be filed with the drawback entry or certificate of manufacture. The drawback allowance shall not exceed the duty paid, less 1 per cent thereof, on the quantity of imported artificial silk yarn used in the manufacture of the exported articles, as shown by the abstract from the manufacturing record, such quantity to be reduced according to the quantity of imported material which the value, if any, of the waste will replace. Rate effective on and after September 30, 1921.—*Treasury Decisions*, Volume 41, No. 2, page 10.

Adjudicated Patents

A decision was rendered in favor of the plaintiff in the recent case of a complaint made by the O'Sullivan Rubber Co., Inc., 131 Hudson street, New York, N. Y., that rubber heels were being manufactured and sold by the Solimine Sales Corporation which were merely imitations of the O'Sullivan heels. An injunction had been previously granted by the court restraining the defendant from manufacturing, selling, or distributing any of its rubber heels while the case in question was pending.

CONTEX—A NEW RUBBER PRODUCT

Contex is a substitute for rubber invented by I. Manchester of Cape Town, South Africa. The claims are that it contracts and expands by climatic influence and is a sure safeguard against expansion and contraction of wood-block paved roads. It prevents bulging by taking up the expansion of wood blocks and when the wood shrinks, the contex resumes its original bulk. It does not harden under pressure. It can be used as a buffer or shock absorber on trains or as stair treads, bath mats, cricket and other balls, stamping pads, silent, non-slipping flooring tiles, and automobile mats. In a severe test as a damp-proof course for buildings, it was said to be successful.

Vulcanization: Past, Present and Future¹

The Processes of Goodyear, Hancock, and Other Early Investigators Are Still Employed in the Rubber Industry

By Philip Schidrowitz, Ph.D., F.C.S.

The Discoverers of Vulcanization

DISCLAIMING intention of being controversial, I am going to be content with the fact that the name of the Englishman Hancock and of the American Goodyear will always be associated with the most important basic rubber trade discovery ever made, just as that of Macintosh will always be associated with the development of proofed garments, or of Parkes with cold curing, and of the late J. B. Dunlop with the pneumatic tire.

Vulcanization

Although we know comparatively little about the true inwardness of the chemistry and physics of vulcanization, we do at least know that it is not a simple or a definite chemical reaction. A definite chemical reaction involves the combination, invariably and under all conditions, of definite weights of both constituents. Now, if we take a mixing made with (an average) rubber and sulphur only and vulcanize it, we find that approximately 100 parts of rubber will combine with 2.5 to 3 parts of sulphur before correct curing is attained. If to the same mixing we add $\frac{3}{4}$ of 1 per cent, or even less, of a violent accelerator, we can obtain a fully vulcanized product, according to factory standards, with a proportion of "combined" sulphur of as little as 0.5 or even less per 100 parts of rubber. It is true that, physically and mechanically, the products will not be identical, but they are both fully cured, and the reaction, therefore, which has taken place, cannot be the same in both instances.

In view of the speculation invited by these phenomena, the author prefers to define vulcanization mainly in terms of its effects as follows:

Vulcanization is a process involving the interaction of rubber and of sulphur—or sulphur compound—which profoundly modifies and improves the thermal and physical properties of the rubber.

Vulcanization in the Past and Present

Hot curing was first discovered by Goodyear and by Hancock between 1839 to 1844; "cold curing" by means of a solution of sulphur chloride by Parkes in 1846; subsequently the "vapor

cure"—which consists in subjecting proofed materials to the vapors of sulphur chloride instead of to a solution of this substance—was introduced, and improved by Abbott in 1878, and in 1888 the dry heat (stove) process of Waddington was evolved. All these methods are still employed, and therefore belong to the present, as well as to the past; but many changes in detail have taken place since they were first introduced.

Minimum or Excess of Sulphur?

Until comparatively recent times, there was a wide difference of practice as between British and United States manufacturers in regard to the quantity of sulphur employed. Broadly speaking, American manufacturers worked with comparatively small quantities of sulphur, their British colleagues with comparatively large amounts. The American method, naturally, involves the use of somewhat higher curing heats and/or more of the well-known catalysts, the British of lower temperatures and/or less in the way of accelerators, mineral or otherwise. While the advent of the organic accelerator is gradually changing conditions generally as regards curing, it is of interest to enquire the reasons for the divergence of practice mentioned above and to ask which is the better? No clean cut answer is possible to either question. I have often wondered whether, as regards aging or life of the goods, the American practice is not more suitable to their relatively dry climate, while our methods are the better in relation to our damp atmosphere. A dry atmosphere exercises a more deteriorating effect on rubber than a damp one. Deterioration may take on one of two forms, hardening up or the reverse, that is tackiness or softening. It seems probable that the rate of hardening is likely to be greater than that of softening at ordinary temperatures, and it may, in a dry climate with moderate temperatures, therefore be wiser to run the risk of the latter than of the former. Some works managers of great experience regard an excess of sulphur as a "good preservative." This fact, possibly, accounts for certain disastrous results which have been noted where organic accelerators have been used in mixings of the "good old kind."

Vulcanizing Plant

The ordinary steam pan, daylight press and the autoclave press are well known. Among other means of hot curing may be mentioned the dry heat curing chambers for garments and footwear in which air under pressure is the heating medium. In similar processes, instead of air, an inert gas, such as carbonic acid, is used at normal or high pressures.

The Waddington stove is a continuous process with a closed hot chamber in which proofed cloth passes over a series of rollers, the passage of the goods being timed to effect the cure.

Continuous processes of various types and for various purposes have been tried and some are working well, particularly in connection with spread goods, hose and belting.

Tire Vulcanizing

The ideal method is that of vulcanizing on a rigid metal core by external pressure, that is by forcing the molds down on the casing or tire by external pressure during vulcanization. But this method entails, particularly in one-cure tires and where a more or less complicated tread design is employed, serious practical disadvantages, namely, very great accuracy in the molds and



Philip Schidrowitz, Ph. D., F. C. S.

¹ Paper presented at The Institute of Rubber Industry, London, January 11, 1922.

in the "building" of the tire are required. Deviation from perfect dimensions in the molds, or of weight or measurement, in building the tire to be molded, will lead to a fault which may be sufficiently evident to involve scrapping, or what is worse, a flaw which will cause early failure of the tire in use. These difficulties led to the development of the airbag system of internal pressure, in which the casing or tire is pressed outwardly against the mold by means of an expanding air or gas container made of flexible material. In this way the mold is always completely filled, but there can be no overfilling, with the attendant excessive stresses, such as are liable when the metal core is employed. The system is very widely used in America, but so far has scarcely found the popularity it deserves in this country. The main drawback of the airbag, hitherto, has been its cost, for, however well compounded, it will not stand more than a certain number of cures. Quite recently expanding metal bags have been designed, which may overcome the difficulty. In the manufacture of cord tires, the airbag is almost essential. While we are developing new fundamental methods of vulcanizing there is still great room for improvement on the purely mechanical side in connection with the molding and curing systems.

Control of Heat, Pressure, Etc.

We possess today perfected practical devices for automatically recording the temperatures, pressures, and time in connection with vulcanization, which might with advantage be adopted by all rubber manufacturers, as is the general American factory practice.

Vulcanization with Sulphur

Direct Methods

The majority of the methods available come under the above heading. Some of these are well known, others are more or less novel or in the experimental stage. It is, of course, possible that some of the latter are already in commercial use without the fact being generally known. The various processes or methods in this group may be sub-divided as follows:

- (1) **ORDINARY HOT CURE.** A mix containing sulphur is used as such. The goods may be cured.
 - (a) In live steam. In molds; in chalk; wrapped; suspended; semi-cured, press or steam, in molds, and finished in chalk or otherwise.
 - (b) In the (ordinary daylight) steam-heated press. In molds or frames; semi-cured in molds.
 - (c) In the steam-heated autoclave press. In molds or frames.
 - (d) In the electrically-heated molds or presses.
 - (e) In hot air. Suspended or standing in or passed through the vulcanizer slowly.
 - (f) In an atmosphere of an inert gas. As (e).
 - (g) By solarization. The sun's rays.
 - (h) Water or oil cures. The goods, in molds or wrapped, are heated beneath the surface of the liquid.

(2) **SULPHUR BATH CURE.** The goods are dipped into and maintained below the surface of molten sulphur. Excess of sulphur is subsequently removed by means of caustic soda.

(3) ACCELERATED HOT CURE.

- (a) The mix contains inorganic accelerators, such as magnesia, lime and litharge.
- (b) The mix contains organic accelerators.
- (c) A combination of (a) and (b).

(NOTE.—The methods used are substantially as under (1), but there must be a readjustment of heats as well as of time, and usually of sulphur.)

(4) **HOT CURING IN SOLVENTS.** The mix is "dissolved" in a solvent and the solution heated in a pressure vessel by means of steam, or in a suitable container immersed below the surface of a liquid of high boiling point. (Stevens.)

(5) ACCELERATED CURING IN THE COLD.

- (a) To solutions or cements of suitable composition accelerators and activators are added in sufficient quantity to produce—within a reasonable time—vulcanized jellies. (Bedford and others; Peachey.)
- (b) A mix, containing an organic base capable of forming an active dithiocarbamate, is exposed to the vapors of carbon bisulphide in the cold. (Bruni.)

(5a) **CURING IN THE COLD BY ULTRA-VIOLET RAYS.** "Solutions" are subjected to the action of ultra-violet rays. (Bernstein and Heilbronner.)

Indirect Methods

(6) **HOT CURE.** Accelerators containing sulphur of which sufficient is split off at curing temperatures to produce vulcanization. (Bruni; Bedford.)

(7) COLD CURING BY MEANS OF GASES.

- (a) The goods are exposed alternately to SO_2 and H_2S gases; sulphur in the nascent state is formed and brings about vulcanization. (Peachey.)
- (b) "Solutions" containing suitable quantities of the gases (cf. 7a) are mixed. (Peachey.)

It is not claimed that the above is an exhaustive list, but it covers the majority of all the comparatively well-known processes. The same qualification applies to the methods set forth below. I have added the names of those associated with the various processes only where these are comparatively new.

Curing with Substances Other Than Sulphur

(8) **COLD CURING WITH SULPHUR CHLORIDE.** The goods are passed through or dipped in a solution of sulphur chloride in a suitable solvent. Or the goods are brushed over with a similar solution.

(9) **VAPOR CURING WITH SULPHUR CHLORIDE.** The goods are exposed, in a suitably constructed chamber, to vapors of sulphur chloride, or more frequently to vapors of the latter somewhat diluted by the vapors of a solvent.

(10) CURING WITH SELENIUM. (Boggs.)

(11) **CURING WITH BENZOYL-PEROXIDE** and other organic oxidising agents. (Ostromislensky.) (With regard to 10 and 11 it is doubtful whether the curing effect is directly comparable either with sulphur or sulphur-chloride vulcanization.)

PRIZE CONTEST REGARDING USES OF RUBBER FACTICE

The Stamford Rubber Supply Co., Stamford, Connecticut, manufacturer of rubber factice and chemicals, is instituting a prize contest, with "The Uses of Rubber Factice in Rubber Compounding" as the general subject. Short papers concerning the importance of this material in various industries will be received until April 15, 1922. All applicants who are interested in participating in the contest, or who wish further particulars should communicate with the company, at the address mentioned. W. F. Gillespie is general manager of the Stamford organization.

RETRADING YOUR OWN AUTOMOBILE TIRES

The tire must first be inflated to full pressure, sandpapered, and thoroughly cleaned with gasoline. Cut a strip of patch rubber, which can be bought in pieces 24 inches long by 3 wide, into two strips of 24 by $1\frac{1}{4}$ inches each. With self-curing cement paste one of these strips along the exact middle of the tread, using the same method with the second strip, until the whole circumference of the tire is retreaded. Any breaks between the pieces of rubber can be filled in with tire "dough" or putty, which will self-vulcanize and make the retread endless. It will be found that the two rubber strips will just cover a 30 by $3\frac{1}{4}$ -inch tire.

What the Rubber Chemists Are Doing

Studies in Vulcanization

B—Some Effects of Acceleration on the Rubber Stress-Strain Curve¹

By P. Schidrowitz and J. R. Burnand

THIS paper deals with the effect of using a minimum of sulphur when a very active catalyst is employed in actual works practice. The catalyst was piperidylthiocarbamate of piperidine, evenly dispersed on a neutral base of colloidal clay. The active catalyst, directly synthesized on the clay, was adjusted so that the mass contained 25 per cent of the former. Except where otherwise stated, all the tests were made with the same batch of a standard thin pale crêpe rubber.

The immediate object was to study the general effects of the use (a) of a comparatively large quantity of sulphur and accelerator, and (b) of a comparatively small quantity of each of these substances, the mixings employed being as follows:

	M	N	N ₁
Rubber ..	100	100	As N, but special
Zinc oxide ..	2½	2½	precautions taken
Sulphur ..	4	2	to remove all trace
Accelerator ..	1	0.5	of moisture from
Colloidal clay ..	3	1.5	substances.

The series of experimental cures on these stocks ranged as follows: 1, 2½, 5, and 10 minutes with comparison with ordinary standard mixing at three hours. The results of accelerated cure may be summarized as follows:

The energy absorption is markedly increased by acceleration of cure.

The coefficient of vulcanization increases rapidly with time of cure. From the technical point of view it may be stated broadly that the one-minute cure corresponds to a three hours' cure of an unaccelerated mixing of a similar rubber, but of double the sulphur content.

At moderate loads distensibility at reasonably correct cures is reduced by something like 25 per cent, but the elongation at break is barely 5 per cent less in the case of the accelerated mixing. As curing proceeds a diminution of approximately 15 per cent in the elongation at break corresponds to a diminution of 35 per cent at a load of 600 grams. This peculiar course of the stress-strain curve, coupled with the high breaking loads, no doubt accounts for the extraordinary toughness and snap of the accelerated cures compared with the unaccelerated mixings.

While at reasonably correct technical cures the elongation at break of the accelerated mixing is decreased by no more than 5 to 15 per cent, the breaking load is increased by something like 60 per cent. This remarkable result is probably due in part to the specific action of the accelerator, but mainly to reduction of the disaggregating heating effect. Also, assuming a similar "type" or slope of curve the energy absorbed in stressing to the break is on a similarly higher plane for accelerated stocks.

"Type" or "slope" of the stress-strain curve varies so little in the case of pure rubber and sulphur mixings, mixed, cured and tested according to the standard method of Schidrowitz and Goldsborough, that it does not affect its practical value as a determining factor in estimating state of cure or "correct" cure. In the case of accelerated mixings type or slope figures are attained beyond anything known in the case of unaccelerated mixings. Assuming that there is a relationship between "type" and "set" it is obvious that the rational employment of an accelerator may, apart from other advantages, materially improve the resiliency and therefore the life of a commercial article.

Accelerated, compared with non-accelerated, mixings show very high figures for energy absorbed or work done. Rubbers which show high breaking load, low elongation at break, and poor type may be strong, but they are rigid rather than tough. Overcuring may produce apparent toughness.

The combination of sulphur was extremely rapid in the accelerated cures and was practically linear up to 2½ minutes. From 2½ to 5 minutes the rate of combination is roughly one-fifth the initial rate, and from 5 to 10 minutes roughly one-tenth.

Sunlight aging tests, subject to quantitative confirmation, show that reducing the original heat effect tends to prolong the life of the rubber appreciably.

A minimum of accelerator is required to produce the full curing effect with a given minimum of sulphur.

Experience has shown that with ordinary unaccelerated mixings cured within a wide range of over and undercure, very serious deterioration will set in. The margin of safety when using an accelerator of the type mentioned above, with a minimum of sulphur, is extremely wide. The explanation, no doubt, may be sought in the following considerations:

(1) The absolute heat effect (that is, of cure) is very small when compared with unaccelerated mixings.

(2) The small quantity of sulphur which is free after the cure renders any further activity on the part of the accelerator difficult.

(3) Probably the bulk of the accelerator, as such, or its transformation products are destroyed or rendered inactive by secondary reactions either during or after the vulcanization process.

For standard conditions the following comparisons hold as between steam cures and press cures for the mixings studied.

One-minute press curing at 141 degrees C. is slightly less effective than a 6-minute rise (steam) to 120 degrees C.; 5-minute press curing at 141 degrees C. is about equal to a 6-minute rise (steam) to 134 degrees C.; 2½-minute press curing is slightly more effective than a 6-minute rise to 120 degrees C. As the latter represents the minimum of technical curing, according to the experience of many tests, it is fairly safe to suggest that 2-minute to 2½-minute press curing represents a correct to slightly under technical cure, 3 to 3½ minutes a full to overcure of the standard mixing.

Plantation Rubber²

At a meeting of the London section of the Institution of Rubber Industry, Dr. H. P. Stevens read a paper treating of the effect of different methods of preparing plantation rubber on its behavior in the factory.

Standardization

Standardization has occupied the attention of planters for many years, almost from the inception of the industry. A special committee of the Rubber Growers' Association made suitable recommendations on the subject. As a result definite instructions were issued for the guidance of the planters, and, it is believed, with good results. The association has no power to enforce these recommendations and it is for the manufacturers to show their appreciation of standardization by purchasing rubber from estates which adopt these measures.

It must be remembered that only about half the total output of rubber is capable of any considerable degree of standardization. In the first place, a great part of the rubber is produced by native holders. Nothing but legislative action can enforce correct methods of treatment. Thus, recently the use of alum for coagulation has been prohibited. Otherwise there is no

¹Journal of the Society of Chemical Industry, Volume XL, No. 22, pages 2687-2747.

²Abstract of "Plantation Rubber: Effect of Different Methods of Preparation on Its Behaviour in the Factory," by H. P. Stevens.

check on treatment of the latex. No satisfactory procedure could be enforced unless each native were personally supervised while he prepared his rubber. Much of this rubber finds its way to centers such as Singapore, where it is washed, crêped, packed, and exported. It is obviously useless for the manufacturer to ask for such rubber to be standardized, and the amount produced must be considerable. The area of native holdings has been variously estimated and may be taken at not less than 25 per cent of the total planted area.

On the cultivated plantations 25 to 30 per cent of the rubber is obtained in the form of scrap, which can be only partially standardized, although the estates do their best to turn out thin brown crêpes clean and uniform.

Only part of the latex can be collected in the liquid state. That which dries on the tree and cups or reaches the ground and mixes with bark shavings, etc., represents unavoidable losses of fresh latex and gives rise to the various grades of rubber scrap now on the market.

It is only with liquid latex that standardization can be satisfactorily carried out, and this is done on the majority of the large estates, mainly by bulking the latex, dilution to a standard rubber content, and the addition of the calculated proportion of acetic acid, which itself has been previously diluted to a standard.

When rubber is required for the manufacture of high-grade articles which are expected to last a long time, a manufacturer should use latex rubber, and even then he must take certain precautions. The obvious precaution is to bulk his rubber, that is, average it by taking pieces from a number of cases for each batch. The averaging might be extended to both the masticating and mixing operations. There is here an opportunity for the manufacturer of rubber machinery to supply a machine for averaging large quantities of plantation rubber.

There is bound to be some variation with latex rubber in spite of standardization. A few of these causes are mentioned. Delay between coagulation and machining or rolling the rubber will result in an increase in rate of cure. The same results from an increase in the thickness of the crêpe or sheet and the time taken for drying. Drying time is to some extent beyond control, as in moist weather the drying will be slow. After a spell of inclement weather the drying house may be overcrowded, reducing the rate of drying, and the rate of cure is correspondingly influenced.

When smoking rubber there are two influences at work. The serum left in the sheet is a potential source of acceleration which would normally be produced as long as the rubber retains moisture. On the other hand the smoke is an antiseptic, and as it is gradually absorbed it puts a stop to the formation of accelerators. If this balance of forces be upset a slower or faster curing rubber may result.

Finally, the rubber may increase in rate of cure during transit if for any reason it absorbs moisture. This may happen although the rubber was in perfect condition when it left the estate. Thus there are a number of factors tending to produce a variation in rate of cure which are not subject to any possible system of standardization.

On the other hand there are some factors tending to render the cure more uniform. Storage of raw rubber under suitable conditions tends to level up the rate of cure; that is, fast vulcanizing rubber tends to vulcanize slower and slow vulcanizing faster.

The author suggested to English manufacturers that they follow the example of the manufacturers of the United States and Canada and make greater use of the new organic accelerators. It is claimed that by their use greater output is obtainable for the same plant, better quality and more uniform results. Practical experience indicates that organic accelerators when added in moderate quantity, "swamp" the natural accelerator and eliminate the problem of variation.

New Type Stress-Strain Curve¹

By W. W. Vogt²

The graphical method here presented is of chief value to those who do not possess a testing machine of the Schopper ring specimen type which graphically records the ordinary stress-strain curve. Most of those who use the dumb bell type test specimen machine are forced to obtain stress-strain data by a method requiring two operators, who simultaneously record load and elongation as the test piece is being stressed. The numerical data thus obtained may then be plotted. Obviously, the graphical method which will set forth the greatest amount of data in the clearest manner is to be preferred.

In the case of a stock which early comes to maximum stiffness and holds over a considerable period of time, its stress-strain curves will form a hopeless confusion of lines if plotted in the ordinary way, load against time. To avoid this confusion the following method was adopted:

Let the vertical axis represent load, either in kilograms per square centimeter or pounds per square inch, figured on the original cross-section. Let the horizontal axis represent time in minutes or hours, as preferred. Then at a given time in cure, plot upward the various loads corresponding to equal increments in the elongation, 100 per cent, 200 per cent, etc. After all cures have been plotted in this manner, draw isoelongation lines connecting the points of equal elongation. Breaking elongation is

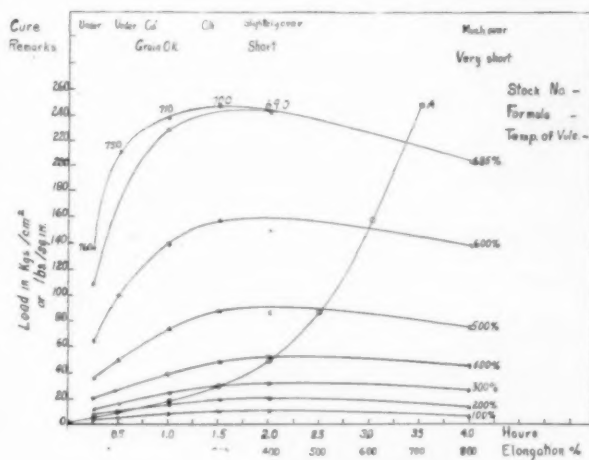


Fig. 1.—New Type Stress-Strain Curve

preferably written in, giving its numerical value. The line connecting the highest series of points will be the breaking load curve, that is, the ordinary tensile time curve. Fig. 1 is a complete graph which should be self-explanatory as concerns the method of plotting.

If it is desired to obtain the area under the stress-strain curve, energy of resilience, which must necessarily be obtained from the regulation style stress-strain curve, we may use proper units and plot elongation along the same axis as time. It is then a small matter to take the values for the best cure and replot. This method necessarily interchanges the axes as ordinarily plotted, but otherwise involves no change. In Fig. 1 the line OA is the regulation S-S curve for the 1.5-hour cure. Or the total energy of resilience may be calculated by the method of J. R. Sheppard.³

If the stress-strain data are obtained in the metric system, that is, as kilograms per square centimeter, then the same method as is used by Sheppard in obtaining energy in terms of inch-pounds

¹Presented at the 62nd meeting, American Chemical Society, at New York, September 6-10, 1921.

²Research Division, The Goodyear Tire & Rubber Co., Akron, Ohio.

³THE INDIA RUBBER WORLD, October 1, 1921, page 29.

per cubic inch, will give in the metric system kilogram-centimeters per cubic centimeter.

The advantages of the new method of plotting stress-strain curves may be thus summarized:

The ordinary tensile time data and stress-strain data are represented on the same graph.

The composite plot is so spread out as to make easy the visual comparison of the physical characteristics of various stocks.

The reversion of the stress-strain curve is very clearly indicated by a dropping of the isoeelongation lines.

Suitable notes as to the hand tests or other methods of judging cures may be written into the graph so that the final curve is, practically speaking, a complete record of the stock in question.

AGING OF RUBBER¹

The author mentioned reviews the subject of aging of rubber goods and methods of testing as brought out in the discussion of the subject at the last meeting of the Rubber Division of the American Chemical Society in New York. He presents an aging hypothesis in which he refers aging to additional vulcanization.

Aging may be surface or internal. Surface aging which results in a hardening and checking of the surface is probably due largely to additional vulcanization by oxygen. On the other hand, internal aging which lowers the tensile strength and the ultimate elongation, is likely to be a combination of additional vulcanization by both sulphur and oxidation which may be released from the compounding ingredient or merely from the air dissolved in the stock during the milling. Such rubber has a perished smell and feel.

Additional vulcanization is probably affected by the following factors:

By Oxygen

Concentration and activity of oxygen.

Accelerators of oxygen such as (1) actinic light; (2) certain compounding ingredients as red lead; (3) impurities such as copper and manganese oxides or salts.

Depolymerization.

By Sulphur

State of cure.

Depolymerization.

Concentration and activity of sulphur.

Accelerators.

Heat.

Conclusion

The author correlates various ideas as to the cause and mechanism of aging. The hypotheses advanced are not considered as proved, but are merely tenable in the light of present knowledge.

There is no more serious problem facing rubber manufacturers and consumers than the study of aging. Without doubt the average life of soft rubber goods as prepared at present could be greatly increased without much effort.

¹Andrew H. King, Chemical and Metallurgical Engineering, December 7, 1921, pages 1039-1042.

CHEMICAL PATENTS

The United States

PAVING COMPOSITION. This is a composition consisting of bitumen and rubber in a proportion approximately one to 1½ of rubber to 100 of bitumen, the composition having colloidal properties and a high point of fusion.—C. A. C. de Caudenberg, Nice-Gare, France. United States patent No. 1,395,396.

CHEWING GUM COMPOSITION. This comprises cumaron resin having a melting point of approximately 60 degrees C. (140 degrees F.), and an oil softening agent.—Harry M. Weber, East

Orange, New Jersey, assignor to Ellis-Foster Co. United States patent No. 1,402,817.

METHOD OF UNITING LAYERS OF RUBBER OF UNLIKE CHARACTER. A layer of rubber without sulphur is interposed between vulcanizable masses of rubber having sulphur of unlike proportions, and the combination vulcanized. The method is applicable to the formation of heels.—George E. Langford, Washington, D. C. United States patent No. 1,402,872.

The Dominion of Canada

VULCANIZATION OF CAOUTCHOUC. Process for the vulcanization of rubber without the aid of heat by means of the interaction of sulphur dioxide and hydrogen sulphide in the rubber itself. The rubber is treated alternately with the gases named at a pressure at or above that of the atmosphere.—Stanley J. Peachey, Davenport, Cheshire, England. Canadian patent No. 215,172.

LEATHER SUBSTITUTE. Rubber and wax of the montan class compounded with sulphur and vulcanized producing leather-like qualities of toughness and slow flexing and devoid of the springy, elastic qualities of rubber.—John Duffield Prince, Boston, Massachusetts, Canadian patent No. 215,173.

The United Kingdom

RUBBER COMPOSITIONS. A phenol-aldehyde condensation product of the plastic class is mixed with 40 per cent of rubber, 7 to 8 per cent of sulphur and usual fillers, and the composition is vulcanized for two hours at 280 degrees F. at which temperature the condensation product is not converted into the hard infusible variety.—A. Speedy and A. P. Crouch, India Rubber, Gutta Percha & Telegraph Works, Silvertown, London. British patent No. 171,803.

INDIA RUBBER SPONGE COMPOSITION. This is made by vulcanizing a mixture of rubber, sulphur, zinc white, and carbonate of magnesia, to which has been added a volatile oil or spirit such as benzene.—A. J. Osterberg and A. Kenny, Judd street, Richmond, near Melbourne, Australia. British patent No. 172,398.

SPEED-X

A new accelerator has recently been introduced to the rubber industry under the trade designation of Speed-X. It consists of 60 per cent diphenylguanidine on 40 per cent of zinc oxide as a base. It is non-poisonous and very powerful, working into the batches easily on the mill. It has no offensive odor during or after vulcanization. It works especially well in hard rubber compounds, tire treads, frictions and inner tubes, including anti-mony tubes. It is effective also in molded work of all sorts and other mechanical goods.

ENERGY IN A RUBBER COMPOUND¹

The work in foot-pounds per cubic inch required to break a piece of rubber is called the energy content of the rubber. It may be determined from a stress-strain curve by adding together all but the last two tensiles, half of next to the last tensile, and the average of the last two tensiles times the last elongation increment in inches. This sum divided by 12 gives the energy in foot-pounds.

¹Paper by J. R. Sheppard, THE INDIA RUBBER WORLD, October 1, 1921.

USE OF TETRALIN IN MAKING RUBBER SUBSTITUTE

If tetralin is used as a solvent for drying oils before treating them with sulphur and sulphur chloride for the manufacture of rubber substitute, the violence of the reaction is considerably diminished.

¹R. Dittmar, Zeitschrift für Angewandte Chemie, 1921, 34, 355.

New Machines and Appliances

Press for Lead-Covering Hose and Cables

ONE method of vulcanizing small hose in long lengths is by encasing it in lead preliminary to heating. Large electric cables are also protected by a covering of lead. The application of the lead covering in both instances is done by the use of a hydraulic press such as is shown in the illustration.

The press is of the reverse cylinder type, with plunger moving downward into the lead container and forcing the metal through the circular die located near the base of the lead container just above the base of the machine. The hose or cable to be encased passes through the lead die and the lead is forced over and around the material as it passes through the block.

The principle of this type of press is that the lead container and die block remain in a stationary position during the pressing operations; there-

fore greater uniformity in the performance of the press is obtained. The material can be fed into the die block and taken from it at a fixed height rather than at constantly changing elevations as is the case with a press with ram working from the bottom upwards and the die block and container mounted on the hydraulic ram. In the press shown all drip-page from the ram above is received in a pan at the top of the ram and is conveyed away.

No pull-back cylinder or weights are required to bring the ram back to its initial position, because there is a constant pressure on the ram which pulls it back as soon as the forcing pressure is released. It will be seen in the illustration that links are provided at the

top of the container and the bottom of the ram proper, by which, without manual effort, it is convenient to raise the container to remove the die block at the bottom. The whole operation of the press is controlled by a combination valve and the pressure being exerted is known at all times by indication on the pressure gage.—The Watson-Stillman Co., 50 Church street, New York, N. Y.

Watson-Stillman Lead Press

Machine for Testing Constant Rate of Load

A new machine suitable for testing a wide range of materials is here shown. It is motor-driven, designed for testing textile

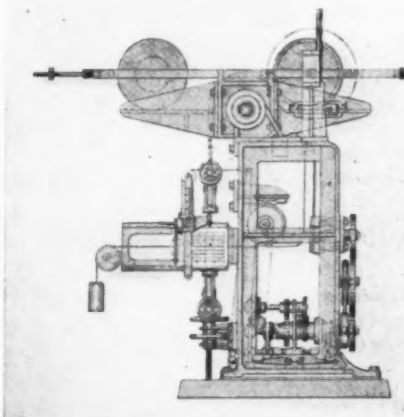
fabrics, and is equipped with an automatic charting mechanism by which a permanent graph is automatically generated during the test.

The well-known theory of the sliding or rolling weight upon an inclined plane is the basis of the invention and by this novel design all difficulties encountered in design and construction in other models have been overcome. Testing machines heretofore available have been of two types, the "constant rate of stretch" and "constant rate of load" machines. This new tester is of the latter class.

In constant rate of stretch machines the machine rate of load as applied to the specimen varies with different capacities of machines and also in the same machine when goods of different elasticity are tested. This gives varying results and especially in the inclinable-balance type of machine where the swing of the pendulum is in itself a variable. No practical means has ever been devised for overcoming this difficulty. Constant rate of load machines while correct in theory have been almost universally condemned because of the impossibility of obtaining uniform results, as any stretch in the specimen must be taken up by hand adjustment which is erratic and unsteady.

The new machine overcomes these objections because it operates

by tipping or inclining the plane, causing weights to roll and exert a pull upon the specimen. This action automatically takes up the stretch and the pull increases with the angle of inclination. A rolling weight upon a plane of this design will not exert even increments of pull per degree of inclination and should the



The New Scott Testing Machine

plane be operated at a constant speed of revolution about its axis the machine rate of load would be variable and not constant. It is therefore necessary to operate this part of the mechanism at a variable speed, increasing the speed of travel as the angle of inclination increases. This is accomplished by the sliding cross-head mechanism on either side of the beam, which produces a second variable, balancing the variable of the weight and giving a constant.

The driving mechanism is operated by a belt from a small motor held within the main frames. Two clutches independently operated control the drive during the test and provide a quick speed return. Automatic stops prevent damage to the machine from neglect by the operator.

When the specimen to be tested has been placed in the clamps the machine is started by means of a small lever at the front. The operator may stop the machine at the instant the break occurs and the strength test will be registered upon a dial and the stretch or elasticity upon the scale in front of the recorder. If desired the machine may be allowed to operate automatically,

the graph developed by the recording instrument giving both strength and stretch records.

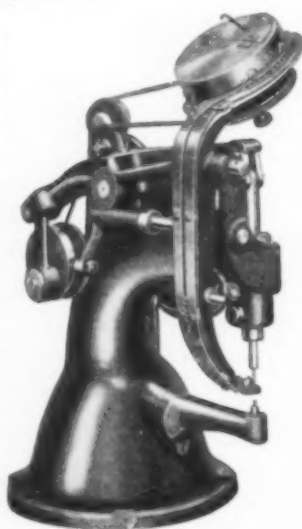
The chart is square-ruled and evenly spaced, the vertical lines denoting strength and the horizontal lines the stretch. As the test progresses, the chart moves horizontally from right to left while the pen, supported from the rider on the scale, moves upward as the specimen elongates. These two movements produce a diagonal line upon the chart showing the exact progress of the test from the start to the break. A special feature of this recorder is that its operation in no way interposes friction to be overcome by pull on the specimen or in any way influences the test. One great advantage in this type of tester is that machines of widely different capacities can be so speeded as to produce the same rate of load. Tests made on any materials regardless of their elasticity should be uniform and comparable. —Henry L. Scott & Co., Providence, Rhode Island.

Eyeletting Machine

The illustration shows a small, easy-running machine used for inserting eyelets in all kinds of rubber goods and footwear. The eyelets are fed automatically from stock held in an enclosed receiver at the top of the machine.

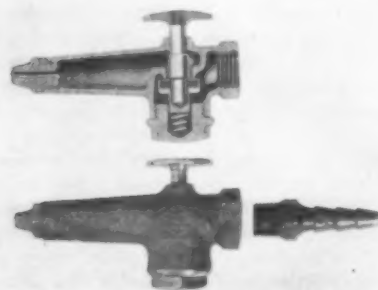
The construction of the machine is such that the eyelet can be inserted after the shoe is vulcanized. This is an important feature where pure white celluloid fast color eyelets are desired. Such celluloid-faced eyelets cannot be submitted to vulcanizing heat without detriment and therefore the insertion operation must be performed after the shoe comes from the heater.

—Eyeletting Machine—Model B
United Shoe Machinery Corporation, Albany Building, Boston, Massachusetts.



Air Gun for Rubber Mills

Every mechanical rubber goods and tire factory, as well as those producing other lines, utilizes compressed air for blowing off hose and inner tubes from mandrels, and for dusting, inflation, and other purposes. Suitable nozzles may be applied for special purposes. Leakage through joints in piping, valves, split pipe, defective castings and wasteage at tool or machine, frequently reduces the efficiency of compressed air from 40 to 60 per cent throughout the system.



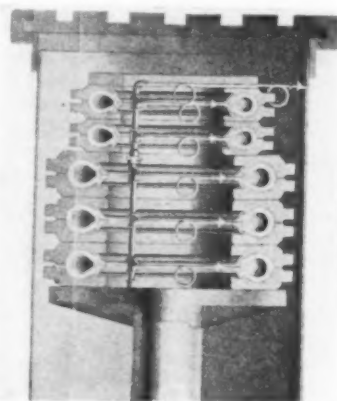
Jenkins Air Gun

The perfected air gun shown in the illustration is air-tight and a certain preventive against costly air leaks. It is fitted with a renewable disk

especially suited to air service. The disk forms perfect contact on the valve seat and takes up the wear of frequent usage. It can be easily and quickly renewed if necessary.—Jenkins Bros., 80 White street, New York, N. Y.

Mold and Airbag Connections

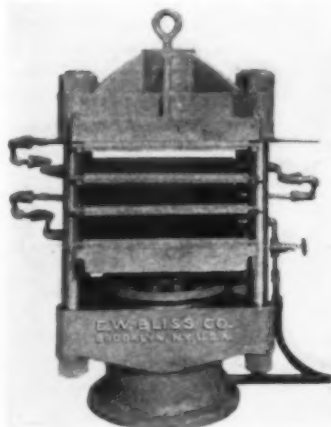
A new invention for maintaining the inflation of a series of airbags during tire vulcanization is here shown. It will be noted that a coiled lead of tubing runs from the vertical manifold air-supply to the airbag mold. The lead is of annealed copper tubing with special connections at each end. This connection eliminates the necessity of brazing. The flared ends of the tubing itself are virtually gaskets and when the connections are assembled, constitute a long-lived and absolutely leak-proof joint. To replace a lead, a new length is cut from a coil of the tubing that is easily accessible, and the connection quickly made by hand. It is claimed that the life of the tubing itself is lengthened by the flexibility imparted by the coil bend and that full operation is assured because of the simplicity and ease with which the connections are made.—The Akron Standard Mold Co., Akron, Ohio.



Steel Vulcanizing Press

One of the latest designs of platen presses for vulcanizing molded rubber articles is shown in the illustration. It is of all-steel construction, except the cast-iron ram, and is specially built for the requirements of the rubber manufacturer. The weight is distributed over a large area due to the broad cylinder base, eliminating the steel base plate of the old-style presses

that rest on columns. The packing is arranged with a separate gland, facilitating quick replacement without removing the ram. The platens can be replaced without dismantling the press. The upper and lower platens are separated from the head and bolster by asbestos sheeting which eliminates unnecessary heating of those parts. The bolster is guided by babbitt lines to ensure even pressure.



Bliss Hydraulic Vulcanizing Press.

The steel construction makes the press compact, durable, strong and light in weight. The rolled steel platens lessen the height of the press and facilitate loading of the molds.—E. W. Bliss Co., Brooklyn, N. Y.

Machinery Patents

The United States

- 1,402,067 Fabric-stripping machine. C. D. Hibbs, Fort Worth, Tex.
 1,402,097 Peeling knife for tires. H. Schwartz, Jr., assignor of $\frac{1}{2}$ to J. H. Hinckle—both of Denver, Colo.
 1,402,160 Apparatus and method of calendaring rubber. J. S. Gwozd, assignor to The Fisk Rubber Co.—both of Chicopee Falls, Mass.
 1,402,171 Tube-stripping machine. C. E. Maynard, Northampton, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.
 1,402,792 Bead-pressing and guide rolls for tire-wrapping machines. Paul Pierce, Chicago, Ill.
 1,402,471 Tire and rim-manipulating stand. A. F. Beck, Manitowoc, Wis.
 1,402,979 Collapsible core for tires. H. E. Townsend, assignor to the Firestone Tire & Rubber Co.—both of Akron, O.
 1,402,980 Tire-vulcanizing mold for use with inflatable core in tire. J. C. Tuttle, assignor to the Firestone Tire & Rubber Co.—both of Akron, O.
 1,402,981 Flexible coupling for flexible shafts. G. L. Weatherlow, Kansas City, Mo.
 1,403,681 Machine for refining rubber. W. A. Gordon, Shelton, assignor to Birmingham Iron Foundry, Derby—both in Conn.
 1,404,042 Apparatus for manufacturing catheters. E. F. Miller, assignor to The Faultless Rubber Co.—both of Ashland, O.
 1,404,118 Solid-tire regrooving machine. A. Hargraves, assignor to the Firestone Tire & Rubber Co.—both of Akron, O.
 1,404,120 Tire-repair vulcanizer. G. W. Hayward and F. P. Anderson, Flint, Mich.; said Anderson assignor to said Hayward.
 1,404,217 Collapsible vulcanizing form for endless belts. L. Murray, assignor to Durkee-Atwood Co.—both of Minneapolis, Minn.
 1,404,320 Apparatus for forming hollow rubber goods. H. W. Roberts and J. H. Overton, Trenton, N. J.
 1,404,847 Tire mold. M. Greenspan, Chicago, Ill.
 1,404,942 Tire-repair vulcanizing device. C. J. Drope, assignor to Derby Tire Co.—both of Minneapolis, Minn.
 1,404,949 Sectional tire core for use with internal pressure. A. J. Fleiter, Akron, O.
 1,404,959 Expandable core. A. Huettner, assignor to The Allsteel Ridewell Tire & Rubber Co.—both of Dayton, O.
 1,405,230 Tire-deflating machine. H. P. Kraft, Ridgewood, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

The Dominion of Canada

- 214,394* Tire molds. S. M. Jackson, assignee of A. R. Thompson—both of Tacoma, Wash., U. S. A.
 214,927 Vulcanizing mold. O. M. Fredd, Hancock, Mich., U. S. A.
 214,928 Dental casting machine with hose connecting bottom of cylinder with valve casing for admitting air under pressure through valve into mold.
 214,966 Tire press and vulcanizer. B. Stiefelmeyer, Kitchener, Ont.
 214,976 Tire-losing machine. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of A. D. Abbott, Jr., Detroit, Mich.
 215,014 Section mold for tires. R. A. Brooks, Chicago, Ill., U. S. A.
 215,015 Tire-retreading apparatus. R. A. Brooks, Chicago, Ill., U. S. A.
 215,016 Adjustable section and retread mold for pneumatic tires. R. A. Brooks, Chicago, Ill., U. S. A.
 215,200 Machine for making pneumatic tire covers. The Dunlop Rubber Co., Limited, London, N. W., assignee of C. Macbeth, Birmingham, Warwick—both in England.
 215,233 Tire-changing machine. The Weaver Manufacturing Co., assignee of I. A. Weaver, both of Springfield, Ill., U. S. A.
 215,234 Tire-changing appliance. The Weaver Manufacturing Co., assignee of I. A. Weaver and J. Sternaman, Jr., all of Springfield, Ill., U. S. A.
 215,235 Tire-removing appliance. The Weaver Manufacturing Co., assignee of I. A. Weaver and J. Sternaman, Jr.—all of Springfield, Ill.
 215,237 Tire-changing machine. The Weaver Manufacturing Co., assignee of I. A. Weaver and J. Sternaman, Jr., all of Springfield, Ill., U. S. A.
 215,238 Tire changer. The Weaver Manufacturing Co., assignee of I. A. Weaver, both of Springfield, Ill., U. S. A.
 215,269 Die for making hollow tubes for tire valves. T. P. Chambers, Toronto, Ont.
 215,301 Tire deflating machine. H. P. Kraft, Ridgewood, New Jersey, U. S. A.
 215,303 Tire deflating machine. H. P. Kraft, Ridgewood, New Jersey, U. S. A.
 215,458 Tire-shaping apparatus. T. Sloper, Devizes, Wiltshire, Eng.
 215,490 Machine for making hollow rubber biscuits. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of H. Z. Cobb, New York City, U. S. A.

*Correction by Canadian Patent Office.

The United Kingdom

- 169,524 Apparatus for manufacturing rubber goods with fabric layers, and contracting one or more layers during shaping of goods. T. Sloper, Southgate, Devizes, Wiltshire.
 170,153 Tire-making machine. The Goodyear Tire & Rubber Co. and F. A. Scherling, 1144 Market street, Akron, Ohio, U. S. A.
 171,363 Apparatus for vulcanizing tire treads to prevulcanized carcasses in steam-heated molds. Naamloze Vennootschap Vereenigde Nederlandsche Rubberfabrieken, Doorwerth, near Arnhem, Holland. (Not yet accepted.)
 171,524 Apparatus for molding seamless nipples. A. Boecler, 7 Pildamsvägen, Malmö, Sweden.
 171,955 Mold for inner tubes. H. Wade, 111 Hatten Garden, London; Paramount Rubber Consolidated, Inc., 5232 Germantown avenue, Philadelphia, Pa., U. S. A.
 172,032 Tire-repair vulcanizer. G. B. Cooper, 401 Penna avenue, Joplin, Mo., U. S. A.
 172,096 Apparatus for making cores of solid tires, such as described in Specification No. 155,086. D. Maggiora, Castello delle Fontanelle, Trespiano, Florence, Italy.

- 172,347 Tire mold. Dunlop Rubber Co., Limited, 1 Albany street, Regent's Park, London, and C. Macbeth, F. Fellowes, and T. A. Reazley, Fort Dunlop, Erdington, Birmingham.

Germany

Design Patents Issued, with Dates of Issue

- 802,051 (November 19, 1921) Gumming press for rubber soles. Oskar Böttger, Hugelstrasse 128, Frankfurt a.M.—Eschersheim, and August Ullrich, Gelnhausen.
 802,217 (September 5, 1921) Cooling apparatus for recovering volatile solvents like benzene, benzol, ether and the like from their vapors and vapor-air combinations. Hans Schmidt and Bernhard Brockhues, Berg-Gladbach.
 802,218 (September 5, 1921) Cooling chamber apparatus for recovering volatile solvents like benzene, benzol, ether and the like, from their vapors and vapor-air combinations. Hans Schmidt and Bernhard Brockhues, Berg-Gladbach.
 802,219 (September 5, 1921) Receiver for recovering volatile solvents. Hans Schmidt and Bernhard Brockhues, Berg-Gladbach.
 802,220 (September 5, 1921) Apparatus for recovering benzene and benzol in the manufacture of rubber goods with dipping apparatus. Hans Schmidt and Bernhard Brockhues, Berg-Gladbach.
 802,881 (September 5, 1921) Mechanism on dipping apparatus batteries in rubber goods factories, for automatically withdrawing single dipping apparatus from the vapor outlet. Hans Schmidt and Bernhard Brockhues, Berg-Gladbach.
 803,454 (December 16, 1921) Model and mold for rubber heels and leather inserts. Paul Wienskowitz, Alexanderstrasse 27, Berlin.
 803,516 (August 21, 1920) Improving box for inner tubes. Chemische Fabrik Eugen Ganz, G.m.b.H., Frankfurt-on-the-Main.

Process Patents

The United States

- 1,402,247 Manufacture of tire valves. E. V. Myers, East Orange, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y. (Application divided.)
 1,402,288 Coating fabric with vulcanizable plastic material. G. F. Fisher, Providence, assignor to Revere Rubber Co.—both of Providence, R. I.
 1,402,293 Manufacture of hollow rubber articles. S. H. Heist, Penlynn, assignor to Penn Rubber Products Corporation, Philadelphia—both in Pa.
 1,402,682 Manufacture of sponge rubber ball with hollow center. Kingo Takashima, assignor to Takasago Gomu Kabushiki Kaisha—both of Tokio-Fu, Japan.
 1,402,918 Manufacture of friction tape fabric. F. B. Carlisle, Seattle, Wash.
 1,403,091 Bead construction. T. Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.
 1,403,965 Valve construction. H. P. Kraft, Ridgewood, N. J.
 1,403,973 Vulcanizing rubber tubes by jacketing, etc. J. G. Moomy, Erie, Pa.
 1,404,597 Treating prepared fabric belting with rubber. E. F. Gingras, Buffalo, N. Y.
 1,405,042 Manufacture of dust caps for tire valves. H. P. Kraft, Ridgewood, N. J.
 1,405,198 Coating fabrics. D. D. Frothingham, Salem, and R. U. Sawyer, Winchester—both in Mass.

The United Kingdom

- 171,508 Joining ends of unvulcanized rubber tubing. F. Creassey, 106 Upper Parliament street, Nottingham.
 171,725 Application of reinforcing patch for valve nipple on inner tubes. H. Wade, 111 Hatten Garden, London; Paramount Rubber Consolidated, Inc., 5232 Germantown avenue, Philadelphia, Pa., U. S. A.
 171,741 Covering tennis balls. A. G. Spalding & Bros., Limited, 318 High Holborn, London; F. J. Faulkner, 131 Johnson street, Lynn, and C. B. Whitney, 22 Churchill street, Springfield—both in Mass., U. S. A.

New Zealand

- 45,775 Securing tire valves to walls of inner tubes. W. K. Hughes, 22 Collins street, and S. G. Pirani, 331 Collins street, both in Melbourne; assignees of E. W. Thurlow, 26 New street, Brighton—both in Victoria.

SAWING BALED FRICTION SCRAP

In the absence of a power cutter designed for cutting baled friction scrap some reclaimers have found that an ordinary two-man cross-cut saw can be used to cut bales of compact rubber scrap in pieces of convenient size for further disintegration in the reclaiming process.

"TIREHEAL" FOR PUNCTURES

"Tireheal," shown by chemical analysis to be of suitable composition not to harm rubber, will heal punctures instantly, the manufacturer claims. It is sold in cans of three different sizes and requires no vulcanizing. It will not freeze and is useful in making a large patch hold.—Tireheal Manufacturing Co., 335 East 82d street, New York, N. Y.

The Editor's Book Table

"FACTS AFFECTING THE IMPORTATION OF RUBBER PRODUCTS into Argentina, Chile, Peru, Brazil, and Colombia." Five separate monographs prepared by the Rubber Division, Department of Commerce, P. L. Palmerton, chief. Published by Bureau of Foreign and Domestic Commerce, Washington, D. C. Paper, 8 by 9 inches.

These publications represent the first instalment of a proposed series to be issued from time to time by the Rubber Division, and planned to cover all of the principal countries of the world. The data furnished are a condensation of all the facts at present available in connection with the countries under consideration, though supplementary sheets may appear later.

"THE TESTING OF RUBBER GOODS." Circular No. 38 of the Bureau of Standards. Fourth Edition, September 28, 1921. Government Printing Office, Washington, D. C. Paper, 127 pages, 7 by 10 inches.

This circular describes the materials and processes used in the rubber industry and the Bureau of Standards methods for testing rubber goods. The various physical tests employed are described and the machines used for the purpose. Data are given showing the effect of various factors, including temperature, on the tensile properties of rubber. The methods used in the chemical analysis are given, together with the reasons for making these tests and their significance. Regulations are given governing the conditions under which tests are made for State and Municipal Governments.

"HENDRICKS' COMMERCIAL REGISTER OF THE UNITED STATES for Buyers and Sellers." Thirtieth Annual Edition. S. E. Hendricks Co., Inc., New York, N. Y. Cloth, 2324 pages, 8½ by 11½ inches.

The publishers of Hendricks' Commercial Register have made some changes and improvements in the recently-issued annual edition of this indispensable volume of reference. The page size has been increased, while the type size is now 7 by 10 instead of 6 by 8 as formerly. The text matter has been opened up, leaving a space between the columns, making it more readable as well as more attractive and giving ample space for checking and memoranda. Although the increased size requires 25 per cent more matter, enough new material has been added to make more than 2300 pages. The reduction in the thickness of the book makes it easier to handle, although it contains more items than any previous edition. As usual the reliable and up-to-date lists given cover the electrical, engineering, machinery, building, manufacturing, chemical and similar industries.

New Trade Publications

"A LITTLE STORY TOLD IN PICTURES." UNDER THIS TITLE THE Buckeye Rubber Products Co., Willoughby, Ohio, has issued a very tastefully printed booklet in paper cover, representing one of the many designs of its step tread products. The factory exterior and interior are shown in a series of reproductions of actual photographs of factory equipment and goods in process of manufacture. A trip through the plant could hardly give a clearer impression of the arrangement and completeness of this company's manufacturing facilities for producing mechanical goods and solid truck tires.

IN A BRIEF AND EFFECTIVE CIRCULAR ISSUED BY THE J. P. DEVINE Co., Buffalo, N. Y., the management shows that it has done its part in the rehabilitation of business through effecting material reductions in the price of its products by reason of increased efficiency of production and elimination of waste. Devine products are industrial chemical machinery of several classes, subdivided into various types. Of special interest to the rubber and allied trades are vacuum drying apparatus, alone and in combination with impregnating apparatus, and vacuum pumps and condensers.

AN ATTRACTIVE LITTLE ILLUSTRATED CIRCULAR ENTITLED, "THE Fruit of the Rubber Tree," is being sent out by the Anderson Rubber Co., Akron, Ohio. Some of the processes used in

the manufacture of toy balloons, rubber balls and footballs are mentioned, while photographs show some of the departments of the Anderson plant. The company claims to be the "originators and largest manufacturers of toy balloons and rubber novelties in the world's greatest rubber center."

THE UEHLING INSTRUMENT CO., MANUFACTURING ENGINEER AND combustion economist, with offices at 71 Broadway, New York, N. Y., at stated intervals has been issuing bulletins in connection with its researches and various activities. Two recent publications, part of a combustion and cost-of-power series, are entitled, "Magnitude of the Power Plant's Chimney Loss" and "Relation between CO₂ and Money Wasted up the Chimney." The subject matter in these bulletins is said to be entirely new, while the tables and charts are based on recent and representative data.

Interesting Letters from Our Readers

Glossaries Have No End

TO THE EDITOR:

DEAR SIR: May I enquire when your Glossary of Rubber Terms, now running in THE INDIA RUBBER WORLD, is to be completed, if ever?

Detroit, Michigan.

ALANSON FORD.

Recovering from a glossary is like convalescing from the flu, a long and uncertain process. The present attack of glossaritis had its beginnings some years ago when the writer was appointed a member of the Nomenclature Committee of The Rubber Association. The other two members, Messrs. Hood and Hodgman, had slight attacks but recovered and without relapse, but the writer got it in its most virulent form. The disease abates at times and then breaks out again as bad or worse than before, and it sometimes becomes chronic. It also spreads to definitions of all sorts. As an instance, on receipt of your letters the word Ford at once insisted upon definition, thus:

FORD. (1) A shallow place in a stream where one's horse, pretending to drink, lies down and rolls; (2) A mechanical exerciser consisting chiefly of an internal combustion engine and four rubber-tired wheels; (3) The surname of a good friend who asks a pertinent question which it is impossible to answer.—THE EDITOR.

Helpful Publicity

TO THE EDITOR:

DEAR SIR: The article on the puncture vine in the February issue of THE INDIA RUBBER WORLD interested me very much. I am one of the many tire users in the Southwest who has had much unpleasant experience with that mischievous plant, well



A Close View of the Puncture Vine

named, "trouble of the earth." I trust that other motorists will appreciate the favor you do them in putting them on their guard against this destructive weed. That is indeed helpful publicity.

Thinking that you might like a close-up view of the business end of the puncture vine, I am sending you a photograph of the remarkably hard, tough, needle-like burrs just as I found them on a road a short distance from here.

Tucson, Arizona.

E. L. SPEERHOLT.

New Goods and Specialties

Rubber Suit Quickly Closed or Opened

THE "Rubber-All" suit of double-texture, rubberized, olive-drab material, is provided with the "Hookless" sliding fastener the length of the front and with buckles and straps at wrists and ankles to make it entirely waterproof. The collar is so shaped that it can be used as a hood.

This suit may be obtained from dealers in automobile accessories or sporting goods, or direct by mail.—Rubber-All Products Co., 821 Broadway, New York, N. Y.



"Rubber-All" Suit

Child's Novelty Helps Footwear Sales

One of the season's novelties in the rubber footwear line is a child's black rubber boot with a red top, decorated with a frieze of black rabbits. The "Bunny Boot" comes packed in cartons colored to help dealer display.—Hood Rubber Products Co., Inc., Watertown, Massachusetts.



"Bunny Boot"

"Diamond Grid" Braced Battery Jar



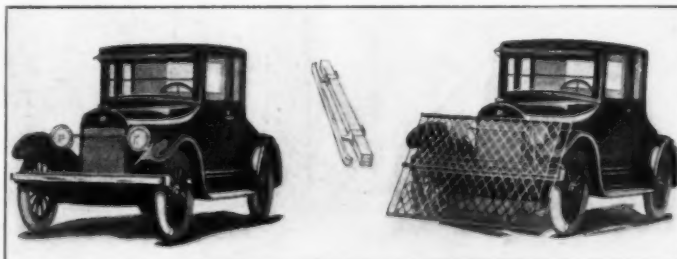
"Diamond Grid" Case

The hard rubber battery jar illustrated here has handles embedded in the jar and features the manufacturers' Diamond bracing used in the Diamond battery grid. This produces a case that is strong but not too heavy to be impracticable. This case is made in small size for Ford cars.—Philadelphia Storage Battery Co., Ontario and C streets, Philadelphia, Pennsylvania.

Protective Automobile Fender

The value of an automobile fender that is unobtrusive and folds automatically into its case when not in use; that operates instantly by a control lever at the driver's seat; and that protects the pedestrian not only from being run over but from contact with any part of the car by extending both above and below the bumper, will be recognized by accessory dealers.

The Dwyer patented life-saving fender is a net fastened to a rubber tube, wound and unwound by springs in the ends of the tube. It may be fastened behind, above, or below the bumper.—William P. Dwyer, West Flamboro, Ontario, Canada.



Dwyer Life-Saving Automobile Fender

Resoling Service for the Sportsman

A prominent dealer in sporting goods clothing and equipment, including rubber-soled tennis, golf, and squash shoes, has provided its shoe factory with facilities for resoling these shoes if the owner leaves or sends them to any of the company's stores.—A. G. Spalding & Bros., 124 Nassau street, New York, N. Y.



"Dryden Double-Wear" Heel

Western Heel Eliminates Buffing

The "Dryden Double-Wear" heel is made in standard thicknesses and sizes, with roughened attached face to eliminate buffing. The 8-nailing arrangement in boys' and men's heels insures a tight joint with the heel seat, and the breast is pitched, adding to the appearance.—Dryden Rubber Co., 1014 South Kildare avenue, Chicago, Illinois.

Another Toy Novelty

The toy illustrated is a combination of the old-time favorites, the



Balloon Toy

balloon and the whirligig. The balloon is inflated through a tube provided with a check valve, and air from the balloon passing through another valve turns the whirligig.—John Tabacco Novelty Toy Manufacturing Co., 307 Jay street, Rochester, New York.



"Treo" Elastic Girdle

Elastic Girdle

The "Treo" girdle, made of surgical elastic webbing, supports, yet allows full play to the muscles. The feature strip above the anchoring waist-line band comfortably controls the diaphragm and supports the back.—Treo Co., Inc., 160 Fifth avenue, New York, N. Y.

New Tire Made "Where Mark Twain Grew"

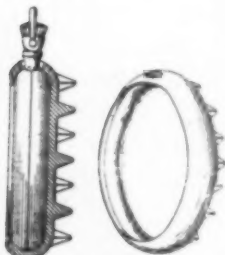
The above is the slogan of a company producing a new make of cord and fabric tires, and red and gray inner tubes, all of standard sizes. These goods are prepared in a new plant, with equipment that is also all new and up-to-date.

The "Mark Twain" pneumatic tires are not guaranteed to give any definite miles of service, but each tire and tube has been closely inspected,

and only the best material is used. A service is assumed of 6,000 miles for fabric tires and 8,000 for cord. "In buying 'Mark Twain' tires," the company claims, "you can expect a tire as good as its name."—Hannibal Rubber Co., Hannibal, Missouri.

Rubber Watch Case Prevents Theft

The patented rubber watch case illustrated here is provided with small rubber teeth on the back, which cling to the clothing and immediately notify the wearer, it is claimed, if a pickpocket attempts to steal the watch so encased.—Albert White, Williamstown, New Jersey.



Rubber Watch Case

Panther Running-Board Mat

A patented running-board mat has a toe guard at the back edge, molded in one with the mat, the whole being of rubber or rubber composition.—Panther Rubber Manufacturing Co., Stoughton, Massachusetts.

"Reversible" Coat Practical, Rain or Shine

Those interested in manufacturing and selling waterproof garments will appreciate the advantages of the Thomas "Reversible" coat shown here, made of khaki-colored cloth of fine weave, calendered on the back with black rubber. The coat is reenforced over back and shoulders, and the collar may be turned up or back as pictured.—The Thomas Manufacturing Co., Box 1042, Dayton, Ohio.



Supersize Cord

The manufacturer of the "Prestone Cord" sells it to jobbers at \$1 a tire profit, letting them make their own re-sale price.



"Prestone Cord"

Rubber Side

Cloth Side

The "Prestone" cord is made of high-grade cord fabric, impregnated before calendered; pure rubber skim-coated cushion stock; and high-grade long-wearing tread compound. It is made by hand on airbags under heavy pressure, and the whole tire is black. Each tire is carefully inspected, eliminating all blemishes, and is built for 8,000 miles of service. The "Prestone" cord is made in the following sizes: 30 and 32 by 3½; 32, 33 and 34 by 4-inch.—The Parker Tire & Rubber Co., Indianapolis, Indiana.

"Championship" Tennis Ball

The "Championship" tennis ball for 1922 is said to embody the greatest durability, accuracy, and resiliency. It has a stitchless cover, is absolutely correct in weight, diameter, and rebound, and has perfect balance.—Thos. E. Wilson & Co., 701 North Sangamon street, Chicago, Illinois.

Sole and Heel for Golfers and Others

The "Neolin" sole and "Wingfoot" heel have been brought up to date in the newest models which are supplied with small, round, resilient knobs so placed as to give maximum grip on the ground,



"Neolin" Sole and "Wingfoot" Heel—Sports Type

whether turf or baked clay, as well as to give secure footing on boat deck, pavement, or track. No spikes or cleats are needed, and such footwear may be worn on polished floors.—The Good-year Tire & Rubber Co., Akron, Ohio.

Non-Skid "Ride-A-Way"

Manufacturers and dealers in juvenile vehicles will be interested in the application of corrugated, non-skid rubber tires to the steel disk wheels of the "Ride-A-Way," which is pedal-operated.—Metallic Industries, Inc., 4125 Forest Park Boulevard, St. Louis, Missouri.



Rubber-Tired "Ride-A-Way"

Interesting Tires

The new Star "Comet" is made only in 30 by 3 and 30 by 3½-inch fabric casings and differs from other Star casings in that it is cured on an iron core. The simple, effective non-skid design makes this possible.—The Star Rubber Co., Inc., Akron, Ohio.



"Comet"

"Diamond Cord"

"Tip Top Tread"

The new Ames Holden "Tip Top Tread" has a center ridge between triangular grooves, continuing around the circumference. A series of rectangular cups parallels the grooves, and

the measurements are scientifically calculated to provide the proper support for all parts. The tread volume insures maximum mileage.—Ames Holden McCready Limited, Montreal, Canada.

A new cord tire to be known as the "Diamond Cord," is being placed on the market. The new tread has special road-gripping power which is, according to Diamond engineers, increased security against side, forward and backward skidding. It is said to have the principles of a tractor wheel and at the same time is noiseless.—The Diamond Rubber Co., Inc., Akron, Ohio.

Pneumatic Foot Supports

The "Perfection" arch support and "Featherweight" heel cushions, both pneumatic, have no metal parts and are made of fine-quality leather backed with a rubber cushion. Small suction cups molded in the rubber collapse and expand as the wearer walks and provide ventilation while preventing perspiration and coldness. A seamless ventilated bunion protector

can be had also.—Elastic Tip Co., 370 Atlantic avenue, Boston, Massachusetts.



"Perfection" Arch Cushion

dries both sides of the upper glass all the way across.—The Geo. E. LaVieses Co., 218 State street, New Haven, Connecticut.

Cleans Both Sides

Instead of fastening at the top of the windshield, the "EZ Way" cleaner rides between the upper and lower glass, and with one sweep of its rubber squeegees wipes and



"EZ Way" Cleaner

Battery Case Electrically Tested

The New "Marko" storage battery case of hard rubber was recently tested by the Electrical Testing Laboratories, with the average from tests of five pieces cut from different parts of the case showing tensile strength of 4,510 pounds to the square inch and an elongation of 1.3 per cent. This case has the handles molded in one with the case itself and is made in three sizes to fit most of the popular automobiles.—Marko Storage Battery Co., 1402 Atlantic avenue, Brooklyn, New York.



"Marko" Hard Rubber Case

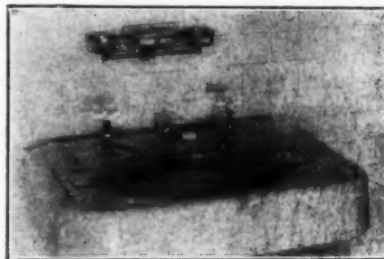
"Paraflor," the Rubber Carpet

From England comes the rubber carpet, "Paraflor," always clean and fresh-looking, soft to the tread, giving firm footing, and reversible. It is furnished in various shades to suit almost any color scheme, and is obtainable in rolls 48 inches wide and 100 feet long. It is suitable for offices, clubs, libraries, theatres, hospitals, public halls, and private houses.—The North British Rubber Co., Limited, Edinburgh, Scotland, and London, England.

Portable Rubber Basin

The patented portable wash basin shown here is formed by clamping a suitable piece of rubber, rubberized fabric, etc.,

between two metal rings, as embroidery hoops are used. To the outermost of the rings are hinged metal supports to maintain the basin within any ordinary wash bowl or on a flat surface, independently. When not in use, the supports fold back



Folding Sanitary Wash Basin

under the basin and the whole slips into a leather case.—Charles H. Windsor, Box 123, Palmyra, New Jersey.

Dish Scraper That May Be Bent

Seekers of new uses for rubber and dealers in kitchen conveniences will welcome the patented rubber-bladed dish scraper for cleaning the sides and bottom of small bowls, kettles, etc. The



Rubber-Bladed Dish Scraper

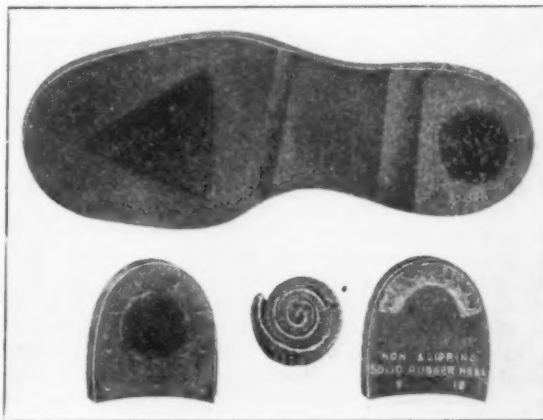
edges are beveled and the wooden handle, where it extends within the blade, is slotted to receive an anchoring portion of the rubber.—Frank Beuckmann, 534 North 22d street, East St. Louis, Illinois.

Non-Slip Sports Shoe Sole and Heel

The illustration shows in detail a new non-slip feature as applied to rubber heels and molded rubber sports shoe soles.

The non-slip is in the form of a plug consisting of a rubber-filled, woven-wire fabric which is cut into strips, coiled and semi-cured in a mold to shape the material into a shallow plug of required form which is finally cured in place in sole or heel.

The weave of the wire fabric is such that in a sole or heel tread the non-slip plug presents a series of close coils which



Burlock Non-Slipping Sole and Heel

afford a firm foothold on icy surfaces yet will not injure floors or carpeting when used indoors.—J. C. Burlock, 116 East 55th street, New York, N. Y.

The Obituary Record

Revolutionized Steam Packing Manufacture

Edward Livingstone Perry, founder of La Favorite Rubber Manufacturing Co., of Paterson, New Jersey, probably the oldest and one of the best informed rubber manufacturers in the United States, died at the home of his son, Edward L. Perry, Jr., at Glen Rock, New Jersey, on February 3, aged 86 years.

Mr. Perry will be remembered by old timers in the rubber

trade as the man who revolutionized steam packing manufacture by originating the first successful red sheet steam packing, known as "Rainbow." He brought out many new and useful applications of rubber to machinery in different forms, but more particularly to the packing of steam joints in engine and boiler equipments.

He was also generally known as the inventor of the vestibule diaphragm used on Pullman railway cars.



Edward L. Perry

Mr. Perry was born in Worcester, Massachusetts, in 1836 and received his education in the public schools of that state. In 1858, when twenty-two years of age he went to New York, N. Y., commencing his career in the rubber business with the North American Gutta Percha Co., at that time located at Broadway and Pine street. Later the name of this firm was changed to the Gutta Percha Manufacturing Co., which was continued until 1867, when it was again reorganized into the Gutta Percha & Rubber Co. In 1860 Mr. Perry was made superintendent of this company which was under very heavy contracts with the United States Government to supply camp blankets, cannon covers, hospital tents and knapsacks.

After the close of the war, Mr. Perry invented and built the life-saving raft "Nonpareil," which he equipped and sent across the Atlantic Ocean from New York to Southampton, England, in 1867. The voyage was successfully accomplished in forty-two days. The novelty of this raft, which was floated on three large india rubber waterproof cylinders, and its excellent sea-going qualities, as well as its success as a life-saving raft, are matters of history.

In 1875 Mr. Perry organized the Peerless Manufacturing Co., later the Peerless Rubber Manufacturing Co., in association with William Foster, Jr., and Henry S. Winans, and was its president and general superintendent until the business was sold to the Westinghouse company. It was during his connection with the Peerless company that he invented "Rainbow" packing.

In 1896 Mr. Perry organized La Favorite Rubber Manufacturing Co., Paterson, New Jersey, which engaged in the manufacture of patented rubber packings and specialties, including "Perry's Red Sheet Packing," which was his original red steam packing under another name. Of this company he was the president and superintendent until 1915 when he retired in favor of C. I. E. Mastin, but retained the position of associate counsel.

Mr. Perry was a widower, his wife having died a few years ago. He is survived by his son, Edward L. Perry, Jr., vice-

president of La Favorite Rubber Manufacturing Co., and a daughter, Mrs. Walter Vernon, of Paterson. Funeral services were held from his son's home and interment was made in Cedar Lawn Cemetery.

In the passing of Mr. Perry, the rubber trade loses another of its leaders of former days, whose notable contributions to the advancement of the industry are being perpetuated by his successors, who still prize the Goodyear formula for curing rubber with sulphur which Mr. Perry's great-uncle, Henry Rider, acquired of Goodyear and perfected.

Long a Rubber Footwear Specialist

Thomas F. Crowley, superintendent of the boot and shoe department of the Lambertville Rubber Co., Lambertville, New Jersey, died at his home in that town January 29, at the age of 74 years.

He was born in New Brunswick, New Jersey, and about forty-five years ago, during the early days of the rubber industry became associated with the Lambertville company. During his long connection with this firm he was the originator of numerous designs of lace rubber shoes, and also held patents on several improvements in the boot and shoe line.



Thomas F. Crowley

For a number of years Mr. Crowley was a director of the Centennial Building & Loan Association and also of the Lambertville Vigilant Society. He was a charter and life member of the

Lambertville Lodge of Elks and served two terms as exalted ruler, being also district deputy for North Jersey. He was also a member of the National Union and Knights of Columbus.

He is survived by his widow, two sons and three married daughters. Funeral services were held at St. John's Church on February 1 and interment was made in St. John's Cemetery. As a mark of respect the plant of the Lambertville Rubber Co. was closed that day. Mr. Crowley was widely known throughout the trade and his passing will be noted with regret by many life-long friends.

Inventor of the Pneumatic-Tired Sulky

Sterling Elliott, a prominent New England inventor and manufacturer, died at his home in Newton, Massachusetts, on February 13, following a brief illness.

Mr. Elliott was born in 1852 at Orion, Michigan. In 1880 he removed to Boston, Massachusetts, where he has ever since been actively identified with industrial affairs.

When bicycling was at the height of its popularity he formed a partnership with the late Colonel Albert A. Pope and engaged in the manufacture of bicycles at Newton and Framingham, Massachusetts. Subsequently he was president of the League of American Wheelmen.

He was well known to the rubber industry as an inventor of pneumatic tires, wheels and rims. His invention of the pneumatic-tired trotting sulky, which immediately superseded the high-wheeled, iron-tired vehicles previously used, was the work for

which he is best known. His most important invention, however, was probably the steering device that is now generally used on automobiles. At the time of his death he owned more than forty United States patents, with several others pending.

As president of the Elliott Addressing Machine Co., of Cambridge, Massachusetts, he had devoted the last twenty-five years of his life to the development of his machine for the rapid addressing of mail matter of all sorts from stencils. Every part

of this machine was of his own invention, as well as much of the special machinery for producing it and the various supplies connected with its operation.

Mr. Elliott is survived by his widow, Harriet Adell (Parker) Elliott; a son, Herman P. Elliott, who is treasurer of the Elliott Addressing Machine Co., and a brother, Henry Elliott, of Chicago, Illinois. Funeral services were held in the chapel at Mount Auburn Cemetery, Cambridge, where interment was made.

Activities of The Rubber Association of America

Tire Mileage Revision Approved

THAT tire manufacturers are in sympathy with the proposed revision of mileage adjustment and the manufacturers' standard warranty as recommended by The Rubber Association, is shown by the following list of ninety-three manufacturers who have approved the association's recommendations:

A
Acme Rubber Manufacturing Co.
Ajax Rubber Co., Inc.
Ajax Rubber Co., Racine Division.
Amazon Rubber Co.
American Rubber & Tire Co., The
Armstrong Rubber Co.

B
Beacon Tire Co.
Bergougnan Rubber Corporation
Blekro Tire & Rubber Co.
Braender Rubber & Tire Co.
Brunswick-Balke-Coller Co.
Buckeye Rubber Products Co.

C
Carlisle Tire Corporation
Columbia Tire & Rubber Co.
Continental Rubber Works
Converse Rubber Shoe Co.
Cupples Co.

D
Denman-Myers Cord Tire Co.
Double Fabric Tire Co.
Dryden Rubber Co.
Dunlop Tire & Rubber Corporation of America
Dural Rubber Corporation

E
Empire Tire & Rubber Corporation

F
Falls Rubber Co.
Federal Rubber Co.
Firestone Tire & Rubber Co.
Fisk Rubber Co., The

G
Gates Rubber Co.
General Tire & Rubber Co., The
Giant Tire & Rubber Co.
Gillette Rubber Co.
Globe Rubber & Tire Co.
Goodrich, B. F. Co., The

Goodyear Tire & Rubber Co., The
Gordon Tire & Rubber Co.
Grow Tire Co.
Gryphon Rubber & Tire Corporation

H
Hamilton Rubber Manufacturing Co.
Hawkeye Tire & Rubber Co.
Hewitt Rubber Co.
Home Rubber Co.
Hood Rubber Co.
Howe Rubber Corporation

I
Ideal Tire & Rubber Co.
Inland Rubber Co.

K
Kelly-Springfield Tire Co.
Kenyon, C. Co., Inc.
Keystone Rubber Manufacturing Co.
Kokomo Rubber Co.

L
Lambert Tire & Rubber Co.
Lancaster Tire & Rubber Co.
Lee Tire & Rubber Co.
Lion Tire & Rubber Corporation

M
McCreary Tire & Rubber Co.
McGraw Tire & Rubber Co.
McLaren Rubber Co.
McLean Tire & Rubber Co.
Madison Tire & Rubber Co.
Marathon Co., The
Mason Tire & Rubber Co., The
Mercer Rubber Co.
Michelin Tire Co.
Miller Rubber Co., The
Mohawk Rubber Co.
Monarch Rubber Co.

N
National Tire & Rubber Co.
Nebraska Tire & Rubber Co.
Norwalk Tire & Rubber Co.

P
Parker Tire & Rubber Co., The
Pennsylvania Rubber Co.
Pharis Tire & Rubber Co.
Porter Rubber Co.

Q
Quaker City Rubber Co.

R
Racine Auto Tire & Rubber Co.
Rubber Products Co., The

T
Thermoid Rubber Co.
Tuscan Tire & Rubber Co.
Tyler Rubber Co.

U
United & Globe Rubber Co.
United States Tire Co.

S
Sample Rubber Co.
Samson Tire & Rubber Co.
Sprague Tire & Rubber Co., The
Spreckels "Savage" Tire Co., The
Standard Four Tire Co.
Standard Tire Co.
Star Rubber Co., Inc., The
Surety Tire & Rubber Co.
Swinchart Tire & Rubber Co.
Syracuse Rubber Co.

V
Victor Rubber Co.
Voorhees Rubber Manufacturing Co.
Vulcan Rubber Co.

Standing Committees

Following are the personnel of the various standing committees recently appointed by the board of directors:

Nominating Committee

Bertram G. Work, The B. F. Goodrich Co., 1780 Broadway, New York, N. Y.; Harvey S. Firestone, Firestone Tire & Rubber Co., Akron, Ohio; George B. Hodgman, Hodgman Rubber Co., Tuckahoe, N. Y.; Frederic C. Hood, Hood Rubber Co., Watertown, Massachusetts; Homer E. Sawyer, United States Rubber Co., 1790 Broadway, New York, N. Y.

Legislative Committee

Charles Neave, chairman, and general counsel of The Rubber Association of America, Inc., 5 Nassau Street, New York, N. Y.; F. C. Van Cleef, The B. F. Goodrich Company, Akron, Ohio; Ernest Hopkinson, United States Rubber Co., 1790 Broadway, New York, N. Y.

Auditing Committee

E. M. Bogardus, chairman, The Fisk Rubber Co., 250 W. 57th street, New York, N. Y.; W. O. Cutter, United States Rubber Co., 1790 Broadway, New York, N. Y.

Banquet Committee

J. N. Gunn, chairman, United States Tire Co., 1790 Broadway, New York, N. Y.; Horace DeLisser, Ajax Rubber Co., Inc., 220 W. 57th street, New York, N. Y.; W. O. Rutherford, The B. F. Goodrich Co., Akron, Ohio.

Outing Committee

J. V. Mowe, chairman, Kelly-Springfield Tire Co., 1710 Broadway, New York, N. Y.; F. R. Henderson, F. R. Henderson & Co., 111 Broadway, New York, N. Y.; F. C. Millhoff, The Miller Rubber Co., Akron, Ohio.

Arbitration Committee

Terms Expire 1925

S. G. Carkhuff, Firestone Tire & Rubber Co., Akron, Ohio; W. E. Bruyn, L. Littlejohn & Co., 133 Front street, New York, N. Y.;

Terms Expire 1924

A. A. Garthwaite, Lee Tire & Rubber Co., 245 W. 55th street, New York, N. Y.; G. A. Ludington, The Fisk Rubber Co., 250 W. 57th street, New York, N. Y.

Terms Expire 1923

A. B. Jones, Kelly-Springfield Tire Co., 200 W. 57th street, New York, N. Y.; J. T. Johnstone, J. T. Johnstone & Co., Inc., 22 William street, New York, N. Y.; W. T. Baird, Baird Rubber & Trading Co., Inc., 9 Murray street, New York, N. Y.

General Tax Committee

F. C. Van Cleef, chairman, The B. F. Goodrich Co., Akron, Ohio; Kennedy M. Thompson, United States Rubber Co., 1790 Broadway, New York, N. Y.; E. S. Kochersperger, Hood Rubber Co., Watertown, Massachusetts.

Industrial Relations Committee

M. A. Flynn, chairman, The B. F. Goodrich Co., Akron, Ohio; C. H. Oakley, Essex Rubber Co., Inc., Trenton, New Jersey; W. R. Murphy, Firestone Tire & Rubber Co., Akron, Ohio; H. T. Martin, The Fisk Rubber Co., Chicopee Falls, Massachusetts; H. O. Smith, Racine Auto Tire Co., Racine, Wisconsin; C. S. Ching, United States Rubber Co., 1790 Broadway, New York, N. Y.

Tire Manufacturers' Division Meeting

The Tire Manufacturers' Division is inaugurating a plan of holding regular quarterly meetings of the entire division at New York, or some city in the Mid-West that would be convenient for the members west of Ohio. The Executive Committee of the Tire Manufacturers' Division therefore announces that on March 23rd the next meeting will be held at the Hollenden Hotel, Cleveland, Ohio. It is hoped that this plan will result in increased attendance and interest.

Tire and Rim Standards Work

A plan for the standardization of tire and rim sizes has been jointly evolved by The Rubber Association and the Tire and Rim Association. According to the new arrangements all proposed tire and rim standards and recommended practices are to be referred to the Tire and Rim Association. If any tire or rim manufacturer desires to market a new size, he should inform the Tire and Rim Association or the general manager of The Rubber Association. If approved by the former association, the subject is referred to the Tire Executive Committee of the Tire Manufacturers' Division of The Rubber Association for final approval. The new standard shall then be transmitted to the Society of Automotive Engineers and to the National Automobile Chamber of Commerce.

Westbound Rates on Solid Tires Reduced

Westbound rates on solid truck tires in carload lots from eastern points to Rocky Mountain and Pacific Coast points have been reduced according to the following schedule, effective March 31:

From	Rates per 100 lbs.	
	Old	New
East of Buffalo, Pittsburgh.....	\$2.66½	\$2.40
Akron, Eastern Ohio.....	2.50	2.25
Western Ohio, Indiana, Michigan.....	2.42	2.18
Chicago territory.....	2.33½	2.10
Mississippi River, East of Missouri River.....	2.25½	2.03
Missouri River territory.....	2.08½	1.85
Denver.....	1.95½	1.76

Reduced Rates on Pacific Coast Rubber Imports

Rates on imported crude rubber from Pacific Coast ports to points as far east as Buffalo and Pittsburgh are reduced from \$1.33½ to \$.75 per one hundred pounds, minimum carload weight 50,000 pounds. This equalizes rates from the Far East to Pacific ports with through rates via Atlantic ports.

George B. Hodgman, Rubber Association Treasurer

To men identified with the rubber industry the recent election of George B. Hodgman as treasurer of The Rubber Association came as no surprise, for his abilities have long been recognized.

It seldom happens in this country, though frequently in the Old World, that a business enterprise remains in the hands of one family through three generations, and maintains consistently, as

in the case of the Hodgman Rubber Co., a reputation for fair and honest dealing and excellence of product. Since the founding of this organization in 1838 by Daniel Hodgman, his sons and now his grandson, the latter the subject of the present sketch, have endeavored to continue a policy which met with the approval of right-thinking men in those early days of the rubber industry.



George B. Hodgman

In assuming his new duties as treasurer of The Rubber Association, Mr. Hodgman will have the opportunity to show still further his genius as an organizer, which he so well evinced in his work of carrying forward the interests of the Rubber Club of America. In 1913 Mr. Hodgman was elected president of the last-mentioned body, in which year was also celebrated the 75th anniversary of the founding of the Hodgman enterprise, the nucleus of the present well-known organization.

The formation of some of the subdivisions of The Rubber Association of today are due to Mr. Hodgman's advice and experience, and wise leadership was never more needed than in the trying times through which the rubber industry is now passing.

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires, Etc.

MONTH	PNEUMATIC CASINGS				INNER TUBES				SOLID TIRES			
	No. Mfrs. Report- ing	Inventory	Production	Ship- ments	No. Mfrs. Report- ing	Inventory	Production	Ship- ments	No. Mfrs. Report- ing	Inventory	Production	Ship- ments
November, 1920.....	36	3,880,016	649,742	806,023	40	6,131,935	742,815	920,938	11	298,875	34,217	34,217
December, 1920.....	43	5,508,380	506,111	1,327,153	43	5,786,929	508,446	1,481,295	12	303,473	16,297	40,828
January, 1921.....	45	5,319,605	703,430	965,417	47	5,586,163	740,824	1,042,617	12	303,753	21,220	29,116
February, 1921.....	45	5,193,018	819,892	1,073,756	46	5,415,464	916,627	1,129,881	12	304,374	23,365	29,599
March, 1921.....	46	4,597,103	1,163,314	1,614,651	48	5,044,861	1,346,483	1,643,690	12	283,800	28,710	43,926
April, 1921.....	49	4,327,445	1,651,418	1,785,951	51	4,916,772	1,762,122	1,983,571	12	269,985	28,859	42,080
May, 1921.....	59	4,451,668	2,100,917	2,085,882	57	4,751,880	2,210,040	2,342,567	12	264,633	35,156	40,122
June, 1921.....	63	4,154,456	2,313,265	2,643,850	60	3,835,098	2,359,928	2,332,673	11	240,336	28,395	49,867
July, 1921.....	63	3,892,037	2,570,524	2,757,581	61	3,122,815	3,020,981	3,603,248	11	220,003	35,123	55,678
August, 1921.....	66	3,934,853	3,043,187	2,894,442	64	3,649,319	4,430,152	3,804,060	11	216,367	55,694	66,866
September, 1921.....	63	3,340,798	1,929,268	2,047,929	62	3,827,830	3,274,822	2,645,758	11	161,832	37,441	50,276
October, 1921.....	64	3,545,030	1,928,271	1,675,169	64	4,732,016	2,843,918	2,016,371	10	163,299	46,274	45,911
November, 1921.....	64	3,908,342	1,756,555	1,342,519	63	5,203,568	2,126,211	1,540,299	10	173,451	43,537	34,356
December, 1921.....	64	3,696,519	1,839,738	1,980,264	64	4,731,021	2,070,098	2,522,710	10	168,515	40,478	39,520

Compiled by The Rubber Association of America, Inc.

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month. "Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any) or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a purchaser and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

News of the American Rubber Trade

Financial

Preliminary Statement of the United States Rubber Co.

Owing to the unusual conditions that prevailed throughout the year 1921, the United States Rubber Co. on February 17, two months in advance of the annual meeting, issued a preliminary statement showing the company's position on December 31, 1921.

Operations for the Year 1921

The net sales for the year amounted to \$164,470,368, being a decrease of \$91,679,762, or 35.79 per cent, compared with the sales for 1920, which were the largest in the history of the company.

After absorbing approximately \$10,000,000, representing the excess cost of finished goods carried over from 1920 and sold in 1921, as compared with the average cost of producing similar goods in 1921, but before the adjustment of inventories, all of which adjustment is definitely allocated to 1920, the net profits for the year amounted to \$470,817 after all interest and other current charges, notwithstanding a reduction of approximately \$18,000,000 in the income from sales, caused by the drastic trade reductions in selling prices made after January 1, 1921. In 1920 the company, before adjustment of inventories reported a net income of \$21,220,983.

Liquidation of Inventories and Liabilities

Total inventories as of December 31, 1921, amounted to \$76,691,777, as compared with \$123,503,030 as of the first of the year, a reduction of \$46,811,253, or 37.90 per cent. Approximately 66 per cent of all the finished goods on hand as of December 31, 1921, was located at the company's sales branches.

Liabilities were decreased \$23,200,000, of which \$13,195,000 was in notes payable, \$8,930,000 in accounts and acceptances payable and accrued liabilities, including Federal taxes and dividend provisions, and \$1,075,000 in bonds and notes retired.

As of December 31, 1920, the contractual liabilities of the nature referred to, principally for cotton fabrics, amounted to \$24,000,000. All of the materials represented by these commitments (except as to \$300,000 worth which has not yet been required) were delivered and taken into account during 1921, in accordance with the original terms of the contracts. The corresponding contractual liabilities as of December 31, 1921, amounted to \$7,200,000, all of which was at or below current market, and as to quantities covered only current requirements.

This reduction in contractual liabilities represents a further liquidation of financial obligations in the amount of \$16,800,000 in addition to the reduction of \$23,200,000 in liabilities reflected by the balance sheet, making a total liquidation of \$40,000,000 during the year as previously stated.

Preliminary Balance Sheet

Adjustment of inventories in both years was charged to profit and loss surplus, with the result that this item was reduced from \$47,325,380 at the close of 1920 to \$30,031,633 at the close of 1921. The general balance sheet as of December 31, 1921, shows net current assets of \$134,766,062, of which \$13,816,477 was in the form of cash, \$41,543,883 in accounts receivable, \$2,713,925 in notes and loans receivable, \$51,248,659 in finished goods, and \$25,443,118 in material and supplies. Current liabilities aggregated \$49,232,561, of which \$36,210,000 were in the form of notes payable, \$9,517,220 in accounts payable, including acceptances for importation of crude rubber, and \$3,505,341 in accrued liabilities.

Chairman Seger's Report

C. B. Seger, chairman of the board of directors, in his remarks to stockholders, said in part:

The year 1921 was one of readjustment and liquidation, and therefore, any statement of profits or income for that period would be misleading unless due consideration is given to the conditions which confronted the company at the beginning of the year, as well as those which developed during the year, and especially to the extent to which liquidation, both as to inventories and financial obligations, has been affected during the year, in connection with operations. The volume of business during 1921 expressed in tonnage or units rather than in dollar volume of sales was satisfactory in view of the general business depression that prevailed practically during the entire year throughout the country, and in fact the world.

The outstanding features in the annual report, as outlined by Mr. Seger, follow:

(a) Financial obligations, including forward commitments, were reduced approximately \$40,000,000, all accounts being met as they fell due and full advantage being taken of all cash discounts.

(b) Approximately \$10,000,000 of excess cost of finished goods carried over from 1920 and sold in 1921, as compared with the average cost of producing similar goods in 1921, was absorbed in the operations for the year.

(c) Drastic trade reductions in selling prices, made after January 1, 1921, decreased the amount which otherwise would have been received for the goods sold during the year by approximately \$18,000,000, thereby reducing net profits to the same extent.

(d) Inventories of materials and finished goods were finally adjusted by further write-down amounting to approximately \$18,544,000, and this was definitely allocated to 1920, \$8,011,000 was charged against reserves previously created, and the remainder, amounting to \$10,533,000, was appropriated from corporate surplus.

As indicated by the balance sheet, the company closed the year in a strong financial condition. Substantial liquidation having been effected, overhead expenses having been reduced to the minimum consistent with efficient operations, and with inventories of finished goods substantially reduced and adjusted on a basis of sound values, and inventories of raw materials and supplies, including forward commitments, on the basis of current requirements, at market prices or lower, the company is in a strong financial and trade position to meet the future, which depends entirely upon general business conditions.

Kelly-Springfield Tire Co.

The Kelly-Springfield Tire Co. reports a net loss of \$506,959 for the year ended December 31, against net profits of \$1,959,294 in 1920. Gross profits on sales amounted to \$6,004,521, against \$7,721,902; operating and administration expenses aggregated \$4,567,427, against \$4,290,967.

The detailed income account for 1921 and 1920 is as follows:

	1921	1920
Gross profits on sales.....	\$6,004,521	\$7,721,902
Operating and administration expenses.....	4,567,427	4,290,967
Operating income	\$1,437,094	\$3,430,915
Other income	445,915	604,531
Total income	\$1,883,009	\$4,035,446
Interest 8% notes.....	477,777	1,492,774
Other interest and charges.....	1,912,191	.....
Extra compensation .....	.....	83,378
Provisions for investment.....	.....	500,000
Total deductions	\$2,389,969	\$2,076,152
Net loss for year.....	\$506,959	\$1,959,294
Profit and loss surplus after dividends.....	\$6,116,777	\$7,203,913

*Net income before Federal taxes.

The general balance sheet on December 31 showed net current assets of \$10,775,715 and net current liabilities of \$863,595. The current assets consisted of \$2,357,977 cash, \$2,891,999 accounts and notes receivable, less reserves for doubtful accounts, and \$5,525,739, the value of inventory figured at cost or market, whichever is lower. The company early last year refunded its short-term obligations by issuance of \$10,000,000 ten-year 8 per cent sinking fund gold notes.

New Incorporations

Alax Tire Co., The, January 14 (Ohio), \$30,000. W. J. Jackson; W. W. Robertson; E. W. Bailey; A. J. Batten; E. F. Peters. Principal office, Cincinnati, Ohio. To manufacture, repair, and retread tires.

Automobile Owners Tire Service Association, January 16 (Massachusetts), \$25,000. A. S. Haber, president, treasurer and director; J. J. Mullen, clerk and director. G. Simon, director—all of 27 School street, Boston, Massachusetts. Principal office, Boston, Massachusetts. To manufacture, buy and sell tires and accessories.

Back Bay Tire Co., January 25 (Massachusetts), \$25,000. M. D. Downey, president, Westfield street, Dedham; F. C. Fais, treasurer, 382 Ashmont street, Dorchester; K. G. Ryan, clerk, Bow street; Newton Lower Falls—all in Massachusetts. Principal office, Boston, Massachusetts. To buy, sell, and repair tires.

Brockton Manufacturing Co., January 23 (Massachusetts), \$25,000. J. T. Shay, president and director, 306 Spring street; F. A. Long, director, 47 Highland Terrace, both of Brockton; W. W. Littlefield, treasurer, clerk and director, Avon—all in Massachusetts. Principal office, Brockton, Massachusetts. To manufacture and sell elastic goods.

Community Distributing Corporation, February 6 (New York), \$1,000. T. L. Healey, 130 West 42nd street; R. A. Curtis, 398 Columbus avenue; L. E. Smyth, 298 Columbus avenue—all in New York City. To deal in tires.

Overall Tire Sales Co., The, January 6 (Ohio), \$15,000. C. F. Ross; J. P. Taggart; W. L. Spring; A. A. Sayre; H. K. Bell—all of Cleveland, Ohio. Principal office, Cleveland, Ohio. To manufacture and deal in tires and tubes.

D. J. H. Rubber Products, Inc., January 19 (Delaware), authorized capital 3,900 shares, par value \$10 each, preferred stock and 410 shares of common stock without nominal or par value. D. and H. Cohen; J. M. Hemphill—all of Philadelphia, Pennsylvania. Delaware agent, Delaware Registration Trust Co., 100 West 10th street, Wilmington, Delaware. To manufacture and deal in all kinds of rubber.

Desmond & Co., Inc., T. A., February 14 (New York), \$600,000. T. A. Desmond; H. S. DeLauris—both of Montclair, New Jersey; F. M. Tienken, 11 Botanic Place, Flushing, New York. To deal in rubber and gutta percha goods.

Fitchburg Rubber Co., January 1 (Massachusetts), \$30,000. G. I. Crocker, president and treasurer; E. C. Thornton, clerk—both of Fitchburg, Massachusetts. Principal office, 564 Main street, Fitchburg, Massachusetts. To manufacture, buy, sell and deal in rubber goods.

Franklin Tire Corporation, February 6 (New York), \$5,000. H. Fried, 1540 Broadway; S. Rubin, 220 Audubon avenue, both of New York; B. Steineck, 126 38th street, Brooklyn—both in New York. To manufacture tires.

Goodyear's India Rubber Selling Co., Inc., February 2 (New York), \$1,000. S. H. Jones, 104 Awan avenue, Forest Hills, R. B. Ostrander, 243 Lakeview avenue, Rockville Centre; O. Borth, 21 Bennett avenue, New York—all in New York. To manufacture and sell rubber goods, footwear, etc.

Grace Tire Co., The, January 20 (Ohio), \$25,000. G. F. Kline, president, general manager and treasurer; A. W. Schlosser, vice-president and service manager; W. E. Laney, secretary. Principal office, 4900 Euclid avenue, Cleveland, Ohio. To distribute Carlisle rope tires for northeastern Ohio and Auburn certified tires for Cuyahoga County.

Henderson, F. R. & Co., Inc., January 4 (New York), \$1,000,000. F. R. H. H. and R. W. Henderson—all of 111 Broadway, New York City. To manufacture rubber goods.

Johnston Tire Stores Co., January 21 (New York), \$250,000. E. A. Buckley, president; S. B. Long, vice-president; J. P. Donahue, secretary and treasurer. Principal office, 360 Temple Theatre Building, 428 South Salina street, Syracuse, New York. To sell tires and tubes.

Keystone Rubber Heels Corporation, February 3 (New York), \$500,000. W. L. Lawrence; K. M. Gove, both of 53 Concord street, Brooklyn; H. A. Powell, Woodhaven—both in New York. Principal office, Brooklyn, New York. To manufacture rubber and by-products.

Mason Tire Co., January 16 (New Jersey), \$125,000. A. J. Holle, 134 Monmouth Road, Elizabeth; W. J. Holle, 311 Mount Prospect avenue, Newark; E. E. Holle, 63 Linden avenue, Arlington—all in New Jersey. Principal office, 230 Halsey street, Newark, New Jersey. To manufacture, buy, sell and deal in tires and tubes.

Maxotire Co., January 14 (Maryland), \$600,000. H. F. Priester; J. P. Tarr, both of 844 Equitable Building; F. Arnold, 224 St. Paul street—all in Baltimore, Maryland. Principal office, 844 Equitable Building, Baltimore, Maryland. To manufacture, purchase, sell and deal in tires, tubes and accessories, etc.

Miller Rubber Glove Co., The, January 17 (Ohio), \$1,000. C. R. Wetsel; W. H. Hackett; E. A. Hollinger; W. M. Renick; M. Owsley. Principal office, 1247 South High street, Akron, Ohio. To manufacture and deal in all goods containing rubber.

Muehlstein, H. & Co., Inc., February 16 (New York), \$1,360,000. H. and J. Muehlstein, both of 41 East 42nd street, New York City; C. Muehlstein, 114 West Van Buren street, Chicago, Illinois. To deal in crude rubber, etc.

Neptune Garment Co., January 23 (Massachusetts), \$10,000. M. Lefkowitz, president, 16 Glenway street; S. Volonsky, treasurer, 22 West View street, both of Dorchester; G. Atkins, secretary, 19 Beach Road, Winthrop—both in Massachusetts. Principal office, Boston, Massachusetts. To manufacture rubber coats.

Pax Elastic & Garter Co., Inc., February 1 (New York), \$2,000. H. B. Denner, 884 Whitlock avenue, Bronx; E. Lerner, 350 West 86th street, New York City; J. O. Bilder, 427 St. Johns Place, Brooklyn—all in New York. To manufacture elastic goods.

Pellock Pen Co., February 3 (Delaware), \$500,000. T. L. Croteau; M. A. Bruce; C. H. Blaske—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To deal in fountain pens.

Red Circle Rubber Co., February 7 (Delaware), \$1,000,000. T. L. Croteau; M. A. Bruce; C. H. Blaske—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in tires and tubes.

Ross, R. & Son, Inc., January 31 (New York), \$7,500. R. T. Sherwood; J. V. Donney; F. J. McIntyre—all of 61 Broadway, New York City. To manufacture rubber stamps and stencils.

Russell Harp Tire Co., January 25 (Ohio), \$10,000. R. E. and H. Harp; B. R. Yoder; E. Boyer. Principal office, 237 Highland avenue, Wadsworth, Ohio. To deal in tires and tubes.

Sams, R., Inc., January 23 (North Carolina), \$25,000. R. Sams and others, Charlotte, North Carolina. Principal office, Charlotte, North Carolina. To buy, sell and deal in tires, tubes and accessories.

Superior Distributing Corporation, February 15 (New York), \$5,000. T. F. Morris, 18 Seaview avenue, Far Rockaway; R. V. Reilly, 349 Lincoln Road; W. B. DeLacy, 1311 Newkirk avenue, both of Brooklyn—both in New York. Principal office, Brooklyn, New York. To distribute tires, etc.

Thorobred Rubber Tire Co., January 30 (Ohio), \$10,000. J. A. MacMillan; W. H. Hurley; P. C. Hunter; R. E. Groswell. Principal office, Dayton, Ohio. To manufacture and deal in tires and tubes.

Wilhelm Tire Co., F. J., January 14 (Ohio), \$5,000. F. J., W. I. and A. A. Wilhelm; G. Oblinger; L. J. Schlenbach. Principal office, 47 Eleventh street, Toledo, Ohio. To manufacture and deal in tires.

The Rubber Trade in the East and South Manufactured Goods

Mechanical rubber goods factories generally are operating on about 50 per cent basis. The outlook shows better prospects ahead, railway, public utility and oil producing companies are seeking equipment, somewhat in the lead of industries in general. Prices are low, consequently the volume of business is not commensurate with the tonnage produced. The only lines in full swing are the seasonal ones of jar rings and garden hose. Heels are also being made in full quantity and are now established as a volume production specialty.

The manufacture of weatherproof clothing is very slow for the opening of the new season. The same applies to automobile topping, although the demand in that line is steadily improving. Insulated wire and cables are at a fair rate of output. The indicated spring revival of building is hopefully expected to bring improvement in this line. Hydroelectric development and public utilities equipment may well be the largest factor in this particular.

The rubber footwear companies are busy on tennis and other sports shoes. Rubber boots and shoes are being made on reduced tickets, in some instances at about one-third less than the normal of capacity output. Druggists' sundries, balls and novelties are in fair production. Occasional tire factories are working at top speed but in general the production averages 60 to 70 per cent of full capacity. In general the trade sentiment is optimistic, but slow improvement is evident.

Lawrence & Co. Succeeds J. Spencer Turner Co.

Lawrence & Co., Boston and New York, who took over the account of the International Cotton Mills, January 1, 1922, on the retirement from business of the J. Spencer Turner Co., announce that J. E. Roumaniere has become a partner of their firm and that William T. White and R. L. Whitman, tire fabric salesmen, and Charles S. Cook, hose and belting duck salesmen, long associated with the Turner company, will continue the sale of these fabrics from Lawrence & Co.'s New York office, 24 Thomas street. Under this arrangement Lawrence & Co. will sell the entire product of the following well-known mills: Bay State Cotton Corporation, having mills at Lowell, Massachusetts, Newburyport, Massachusetts, Lisbon, Maine and Le Roy, N. Y.; Stark Mills, Manchester, New Hampshire; LaGrange Mills, LaGrange, Georgia; and Hogansville Mills, Hogansville, Georgia, as well as the product of the Imperial Cotton Co., Limited, and the Cosmos Cotton Co., Limited, in Canada.

The taking over of the International Cotton Mills will make Lawrence & Co. one of the leaders in duck and tire fabrics, as they have been for many years in cotton, woolen, and other materials manufactured by the Pacific Mills, the Merrimack Manufacturing Co., Ipswich Mills, and the Whittenton Manufacturing Co.

New York

J. Newton Gunn, president of the United States Tire Co., New York, N. Y., continues as president of the Lincoln Highway Association. All the former officers were reelected at its recent annual meeting in Detroit, Michigan. Edsel B. Ford was the only new member of the board of directors chosen. Other directors include John N. Willys, W. C. Durant, Alvin Macauley, W. V. Rutherford and Sidney D. Waldon.

Sheldon P. Thacher, technical assistant to the president of The United States Tire Co., Broadway and 58th street, New York, N. Y., has been recently appointed chairman for 1922 of the executive committee of the Tire and Rim Association, 535-537 Leader News Building, Cleveland, Ohio. Mr. Thacher, before his present connection with the United States Tire Co., acted as chemist of the Peerless Rubber Company, and is the inventor of certain patented processes for vulcanizing rubber.

Among the new members of The Merchants' Association, New York, N. Y., who were elected at a recent meeting of the executive committee the following was noted:—Rolle Rubber Company, S. B. Flint, secretary, 84 Reade street, New York, N. Y., rubber goods.

A removal of its executive offices to more commodious quarters at 1780-82 Broadway, New York, N. Y., was made about February 1 by the Dominion Asbestos & Rubber Corporation, formerly of 154 Nassau street. The company will retain its present store and shipping office at 67 Murray street, for the convenience of its marine and industrial patrons. Increased facilities have become necessary for the handling of the firm's rapidly growing automotive equipment business, and this line of supplies will be transferred to the new offices. P. H. Cooney is sales manager of the company.

A. G. Spalding & Brothers, dealers in sporting goods, whose executive offices are at 126 Nassau street, New York, N. Y., have recently bought the factory building of S. Kenyon Co., 954 Pacific street, Brooklyn, New York. The new purchase will be used as an extension of the Spalding plant at 660 Pacific street. Officers of the Spalding organization are: Julian W. Curtiss, president; H. Boardman Spalding, vice-president and treasurer; Clarence S. Lincoln, vice-president; Charles F. Robbins, vice-president; and John T. Doyle, secretary.

Ernest Schulthess, who is general manager of the Atlas Rubber Co., 26 Cortlandt street, New York, N. Y., and also represents the Manhattan Rubber Manufacturing Co., 61 Willett street, Passaic, New Jersey, is well known to the mechanical goods trade of the metropolitan district. His business career began in 1901 with the Manhattan Electric Supply Co., this being followed in turn by connections with the Gutta Percha & Rubber Manufacturing Co., the Republic Rubber Co., and the Manhattan Rubber Manufacturing Co.



Ernest Schulthess

On March 1, 1921, Mr. Schulthess founded the Atlas Rubber Co. for the distribution of rubber goods of every description, and soon after invented a special type of heavy duty fire hose, to the production of which the organization is now devoting considerable attention. Mr. Schulthess is a member of several clubs and the Rubber Association of America.

The steadily growing business of The Miller Rubber Co., Akron, Ohio, has necessitated the establishment of a direct factory tire branch in Buffalo, New York, at 1436 Main street, with R. N. Harwick, a former Buffalo man, in charge. The present street address is however only temporary, and a permanent location will be announced later.

Eastern and Southern Notes

The Hydro-United Tire Co., Inc., Pottstown, Pennsylvania, recently declared a dividend of 12 cents a share, payable February 15 on common stock of record January 15, 1922.

The Electric Hose & Rubber Co., Wilmington, Delaware, reports that its plant is now running at full capacity, and that orders on hand ensure a continuance of this speed for the next three months. Officers of this organization are: George S. Cappellet, president; Edmund Mitchell, vice-president; and C. D. Garretson, secretary, treasurer, and general manager. The Electric Hose & Rubber Company is a member of the Rice Leaders of the World Association.

The DuBois Rubber & Tube Co., Chattanooga, Tennessee, manufacturer of "Lookout" tires and "Red Giant" compression tubes, is now operating with new machinery, in a new plant. The output for an entire year has been sold in advance. L. H. Lightfoot is first vice-president and sales manager of the company.

The St. Mungo Manufacturing Company of America, 121 Sylvan avenue, Newark, New Jersey, manufacturer of the "Colonel" golf ball described some months ago in THE INDIA RUBBER WORLD, has recently opened an office at 286½ Peachtree street, Atlanta, Georgia. Stanley L. Hern, former manager of the company's Philadelphia office, is in charge.

BIRMINGHAM MEETING OF AMERICAN CHEMICAL SOCIETY

The Secretary of the American Chemical Society has issued to members the general program for the spring meeting of the Society to be held at Birmingham, Alabama, April 3 to 7, inclusive. Divisional meetings will take place April 5 and 6.

Dr. W. C. Geer of The B. F. Goodrich Co. will give an address at the afternoon general meeting, April 4, on "Recent Developments of the Chemistry of Rubber."

The Rubber Trade in New Jersey

Rubber Manufacturers' Association of New Jersey

The Rubber Manufacturers' Association of New Jersey held its bimonthly meeting at the Stacy-Trent Hotel on February 13. The occasion was made a very pleasant dinner conference at which covers were laid for thirty.

The following companies were represented: Acme Rubber Manufacturing Co., Ajax Rubber Co., Inc., Crescent Insulated Wire & Cable Co., Empire Rubber & Tire Corporation, Essex Rubber Co., Globe Tire Co., Hamilton Rubber Manufacturing Co., Home Rubber Co., Mercer Rubber Co., United & Globe Rubber Co., Vulcanized Rubber Co., Whitehead Bros. Rubber Co., Woven Steel Hose & Rubber Co., Howe Rubber Co., New Brunswick, New Jersey; Quaker City Rubber Co., Philadelphia, Pennsylvania; Voorhees Rubber Manufacturing Co., Jersey City, New Jersey.

The president, Charles E. Stokes, of the Home Rubber Co., presided, and under his able direction the meeting was successful from both a business and social viewpoint. He announced the personnel of the various standing committees of the association for the ensuing year. Each appointee expressed his intention to contribute as far as possible towards making Mr. Stokes' administration a record for things accomplished.

The outlook for the rubber industry was discussed and the

general opinion was that the worst is over. It was claimed that perhaps no other industry has so fully liquidated and is today on as sound and as nearly a present value basis. This is manifest by the annual reports of the leading manufacturers in the industry, all of which have shown either substantial reductions in profits or reduction of surplus, either or both of which mean getting on a more solid foundation and building for better conditions just as soon as there are any indications of business improvement.

W. H. Sayen, secretary, was unable to be present at the meeting because of his absence on an extended business trip in the West. Reports received from Mr. Sayen indicate he is finding business better than expected.

Members of the Rubber Manufacturers' Association of New Jersey were shocked to learn of the unexpected death, on February 26, of John J. Voorhees, president of the Voorhees Rubber Manufacturing Co., Jersey City, New Jersey. There was probably no other member of the association so greatly liked by the membership nor one in whose personal welfare so many were interested. His obituary will appear in the April issue.

Trenton

Fire at the plant of the Vulcan Recovery Co., Inc., Trenton, New Jersey, entirely destroyed one of the buildings, without, however, damaging other sections of the plant. The loss sustained, mostly covered by insurance, was approximately \$15,000. C. H. Oakley, treasurer of the company, reports that the production of reclaimed rubber will be curtailed to the extent of about 30 or 40 per cent for several weeks.

At the recent meeting of the Philadelphia Rubber Manufacturers' Association, A. Boyd Cornell, of the Hamilton Rubber Manufacturing Co., Trenton, was elected a member of the executive committee. D. P. Morgan, Jr., Trenton, connected with the Gustin-Bacon Manufacturing Co., Philadelphia, was reelected secretary.

Trenton rubber manufacturers are participating in the "Trenton Products" display week as arranged for by the Trenton Chamber of Commerce. This consists of exhibits of Trenton-made goods in the display windows of the leading retail merchants of the city. The display space is distributed among the various manufacturers of the city, which is the center of rubber, pottery, linoleum and iron and steel manufacturing. Handsome exhibits were made by nearly all of the rubber manufacturers. The idea is based upon the belief that every citizen in the community is a potential advertiser of the City's products to the outside world, and should be educated to a more or less comprehensive knowledge of industrial products of his city.

The John E. Thropp's Sons Co., Lewis street, Trenton, New Jersey, manufacturer of rubber-working machinery, has organized the Hendrie Rubber Tire Co., capitalized at \$200,000 under the laws of New Jersey, to take over and operate the plant of the Hendrie Rubber Co., Torrance, California. The plant will be arranged to develop a daily capacity of 350 tires and 200 tubes. The officers of the new company are: Thomas H. Thropp, president and general manager; Peter D. Thropp, vice-president; John E. Thropp, secretary; and William Baker, treasurer. The last-named will be in charge of operations and live at Los Angeles.

John S. Broughton, president of the United & Globe Rubber Co., Trenton, New Jersey, recently appointed Fred D. Williams as his assistant. Mr. Williams has for the last three years been general manager of the L. H. Gilmer Co., Philadelphia, and prior to that was for several years with Johns-Manville, Inc., and the United States Rubber Co. The United & Globe Rubber Co. specializes in the manufacture of automotive products, as well as mechanical rubber goods.

The King Rubber Co., whose offices and salesroom in the Commonwealth building, Trenton, were damaged by fire, have opened new quarters in the same office building. The blaze started

in the King offices and caused a serious loss. Several hundred tires, rubber coats, etc., were destroyed.

New Jersey Notes

W. P. Braender, secretary and treasurer of the Braender Rubber & Tire Co., Rutherford, New Jersey, reports that M. E. Morris, of Akron, Ohio, formerly assistant general manager of the California Goodyear plant is now vice-president and general manager of the Braender organization. Mr. Morris has had much experience in various departments of the rubber industry.

Another recent addition to the staff of the Braender company is that of F. J. Sullivan as comptroller. Mr. Sullivan was previously associated with the Dunlop Tire & Rubber Corporation of America, Buffalo, New York, while during the war he was United States Navy representative at the plant of The Goodyear Tire & Rubber Company, Akron, Ohio.

The Maywald Rubber Co., Nutley, New Jersey, held its annual meeting at the factory recently, when F. J. Maywald was reelected president; C. C. Plummer, vice-president and treasurer, and E. A. Maywald, secretary. R. Mulder and Frank R. Allen were elected directors, the other directors being A. L. Higbee, H. W. Davis, C. C. Plummer, and F. J. Maywald. President Maywald reported a very successful year and said that prospects for the coming year were bright. During 1921 the capacity of the factory for the manufacture of household and surgeons' gloves was increased more than 300 per cent and the stockholders are well pleased with the reports of the officers.

The Baldwin Tire Co., 27 Frelinghuysen avenue, Newark, New Jersey, is distributor for the Polack solid tires manufactured by The Buckeye Rubber Products Co., Willoughby, Ohio.

The Rubber Trade in Massachusetts Manufactured Goods

Steady improvement, even if somewhat slow, continues to justify the general optimism of Massachusetts rubber goods manufacturers. Rubber footwear, for which this is an important center, is at almost capacity production. February has lived up to its reputation for frequent storms so that excellent retail business in rubbers and overshoes has been passed along to manufacturers. Factory orders thus far received indicate that 1922 will be the biggest canvas footwear season which manufacturers have ever had. It is believed that the exhibits at the convention of the National Shoe Retailers' Association in Chicago, Illinois, as well as stabilized prices materially stimulated this business. The heel demand continues unabated.

Retail tire business is obviously dull, but manufacturers are generally increasing production in response to increasing orders and in anticipation of a brisk demand to replenish depleted stocks when the active spring season arrives. Business in druggists' sundries has been satisfactory, but the demand for most mechanicals continues subject to the slow but certain improvement of general business. Slightly increased building activity has brought a moderate demand for insulated wire, but this branch of the industry is confidently anticipating a lively spring business. The firmer pulse of the rubber industry in this state is perhaps best shown, however, by the encouraging reports of dealers in crude rubber and other raw materials who are finding a steadily increasing demand for their products.

Cotton Fabrics

As was stated last month, the wage question has proved to be the uncertain factor in an otherwise encouraging cotton textile situation. Wage reductions and increase of working hours in many mills has resulted in widespread strikes and shut-downs, but thus far they have been chiefly in Maine, New Hampshire and Rhode Island, leaving the plants in Massachusetts and Connecticut where tire fabrics are manufactured practically unaffected.

To what extent the present situation may spread, if at all, remains uncertain.

Unlike most cotton mills, the production of most large tire fabric mills is tied up on long-term contracts with tire companies. Prices are fixed on a sliding scale based on the cost of raw cotton, which is usually purchased at prices specified by tire companies. Thus operations are often directed by tire companies, and as they are not anticipating requirements as liberally as formerly, most mills are running at reduced schedules. Large tire companies are not placing much new business, but are calling for deliveries against their long-term contracts. Enough cotton for the first six months of 1922 has been bought around 30 cents a pound and this is being averaged up with remaining high-priced stocks, of which only about 25 per cent remain.

National Shoe Wholesalers Meet

At the annual meeting of the National Shoe Wholesalers' Association, held January 17 in the Copley-Plaza Hotel, Boston, conservative optimism was the keynote. All the speakers and committee reports pointed to better business just ahead and emphasized the general opinion that stocks are low and prices fairly well stabilized. I. R. Fisher, of Nathaniel Fisher & Co., New York, N. Y., chairman of the rubber committee, reported that steps had been taken to persuade rubber footwear manufacturers to give a premium in the shape of a special discount on orders placed early, and to increase the net discount.

Charles Barnes, of the United States Rubber Co., quoted figures to show that rubber footwear prices reached their peak in January, 1920, when an advance of 43 per cent above 1913 prices was reached, as compared with peak prices of other commodities ranging from 105 to 237 per cent. It is estimated, he said, that raw materials for rubber footwear manufacture can be purchased this year for 22 per cent less than in 1913. This is due entirely to the big drop in rubber prices, as the other materials used show an increase of about 70 per cent over 1913. Rock bottom prices have been reached, he asserted, and this with low wholesale and retail stocks points to better business.

Boston Notes

The Seiberling Rubber Co., Akron, Ohio, has opened temporary headquarters at 25 Huntington avenue, Boston, in charge of William A. Golden as branch manager. Mr. Golden is a pioneer in the automotive industry, having been prominently connected with The Goodyear Tire & Rubber Co. for a number of years. He enjoys a wide acquaintance in the trade and is well equipped to undertake the distribution of the new Seiberling cord tire in this territory.

Guy D. Niles, for some time manager of the Boston branch of the Lee Tire & Rubber Co., 1100 Boylston street, has been appointed New England manager and will take over direction of the company's sales in all the New England states. Mr. Niles is well-known in the trade and one of the governors of the Bay State Automobile Association.

The Citizens Rubber Co., tire dealer, has removed to larger quarters at 86 Federal street, Boston.

After eight years in the Washington, D. C., and Baltimore, Maryland, branches of his firm, Ellery D. Manley has returned to Boston as branch manager of the Firestone Tire & Rubber Co. Mr. Manley joined the Firestone organization eleven years ago in New York, N. Y., and after serving in various capacities in Buffalo, New York, and Dallas, Texas, came to Boston as office manager under Thomas Glenn, then branch manager. His return in charge of the Boston branch is welcomed by many friends in the automotive industry.

Preparations for the Boston Automobile Show to be held from March 11 to 18, inclusive, are nearing completion. In addition to the main show in Mechanics Building there will be a sale on for high-class cars in the ballroom of the Copley-

Plaza Hotel from March 13 to 17. Every available foot of space has been sold and this year's exhibition promises to be the biggest display of miscellaneous accessories ever located under one roof.

At the recent annual meeting of the New England Shoe and Leather Association in Boston, new officers were elected, and plans considered for operations in 1922. Among the list of directors the following names were noted: Charles A. Coe, United States Rubber Co., Boston, Massachusetts, and Philip H. Fraher, United Shoe Machinery Corporation, also of Boston.

At the annual meeting of the Franklin Rubber Co., Boston, the following officers were reelected: Asa C. Merrill, president; Everett L. Fuller, treasurer; Lorin L. Fuller, assistant treasurer. Business for the past year has been satisfactory to the stockholders and every indication points to a reasonable amount of business for 1922. The firm is at present working out some new and advanced styles in women's single-texture and men's double-texture raincoats.

Miscellaneous Massachusetts Notes

Although Grow cord tires have been on the market only about two years they have attracted the attention of automobile manufacturers. Samuel Grow, treasurer of the Grow Tire Co., Canton Junction, announces that the company is negotiating to furnish Grow tires as standard equipment for one of the best-known automobiles, while a second widely-known automobile company has asked for bids. Increases in factory and equipment to take care of this original equipment business are already under way.

The Plymouth Rubber Co., Inc., has been organized under Massachusetts laws to manufacture rubber products and has purchased at bankruptcy sale the assets and liabilities of the former Plymouth Rubber Co., at Canton. The new company has 1,500 shares of preferred stock, par value \$100, and 26,000 shares of no par value common stock, of which 4,000 shares are to be designated "Class A" and 22,000 shares "Class B." Of the "Class A" common, 1,302 shares are to be designated as "Series 1," 1,336 shares as "Series 2," and 1,362 shares as "Series 3." Until December 31, 1923, the first preferred stock, which will pay 7 per cent, is convertible at any time into "Class B" common at the rate of four shares of common for each share of preferred. The incorporators are Maurice J. Hamilburg and Max E. Bernkopf, of Boston, and Reuben B. Gryzmish, of Brookline, Massachusetts.

Pursuant to decrees of sale entered by the superior courts of Massachusetts and Rhode Island, all property and interests of the bankrupt O'Bannon Corporation, West Barrington, Rhode Island, were offered at public auction to the highest bidder on February 17 at Taunton, Massachusetts, by the special master, Arthur A. Thomas. The sale included the imitation leather and rubber cloth plants at West Barrington, Rhode Island, the oilcloth plant at Taunton, Massachusetts, and a controlling interest in the dye plant of the Nonnabo Chemical Co., at East Providence, Rhode Island, and of Smith, Abbott & Co., now in process of liquidation, together with all machinery, equipment, materials, merchandise, and rights of every sort, including good will and use of the firm name. At the time of writing it is unknown what bids if any were made. Under the receivership the plants in Rhode Island have been operated by Richard Le Baron Bowen, and in Massachusetts by Ripley L. Dana, as the receivers of the company.

Arthur T. Hopkins resigned January 1, 1922, as assistant general manager of the United States Rubber Co. For several years he has been located at the L. Candee & Co., rubber boot and shoe plant at New Haven, Connecticut, in charge of the development of the department of industrial relations.

Lester I. Riis, formerly with The Star Rubber Co., Inc., Akron, Ohio, as eastern district manager, is now connected with The Braender Rubber & Tire Co., Rutherford, New Jersey, as eastern

sales representative. Mr. Riis' district will include New York and New England, where he is well-known by the dealer trade.

The Rubber Trade in Ohio Manufactured Goods

During the last month the rubber industry reached that static position which it was predicted would be attained about this time of the year, with production comparatively high, awaiting the active demand for tires that is anticipated when the motor-ing season opens.

The Goodyear Tire & Rubber Co., during the early part of February, announced that production had been increased to 22,000 tires a day from the 20,000 attained at the beginning of the month, and from 19,000 which was the factory schedule during January. This ticket is some 2,000 larger than was expected during February but constantly increasing orders from dealers and for original equipment made the advance a necessity. The company employed 500 former workers during one week to bring about this schedule. The company incidentally is leading the world in the production of automobile tires at the present time.

The Firestone Tire & Rubber Co. increased during the month to 18,000 tires a day from a previous work ticket of 17,000. Most of the other factory schedules remained the same, with minor changes, while none reported an actual decrease in production.

Reports are constantly heard of large Ford orders being received by several of the large factories, but these reports unaccountably continue to be denied by those in a position to verify them. Other manufacturers are placing larger orders for original equipment following formation of plans to increase automobile production during the next few months.

The Firestone Steel Products Co. at the same time reports an increase in rim orders, which means that more than 50 per cent of the automobile manufacturers of the country reflect, by actual orders, the better tone in the industry.

Reliable estimates place the present automobile tire output in Akron at about 72,000 to 75,000 tires a day, and although the figures seem low the same authority estimates that at the present time approximately 23,000 men and women are employed by the rubber factories. This figure, if correct, compares with 71,000 employed at peak, 13,000 employed in January, 1921, and 23,000 employed in July of that year.

Footwear sales are very satisfactory. During the first month of the year women's four-buckle arctics were much in demand and now the call is for boots and light rubbers. Preparation for spring farmwork and some renewed activity in mines and lumber camps has occasioned the buying of rubber footwear. Prices, following the 8 per cent reduction, have been stabilized, and dealers have reconciled themselves to this reduction. On the whole the present year presents very good prospects for rubber footwear.

Rubber sundries orders are gaining daily and weekly according to all reports. This is looked upon as an indication that dealers generally have practically depleted their stocks and that an avalanche of orders may be expected as soon as the hand-to-mouth buying policy, which has characterized this part of the rubber industry during the past year, is abandoned.

Reports from mechanical goods factories indicate that improvement in this line has been exceedingly slow and spotty. It is not expected that this part of the rubber industry will show material increases until early spring.

South American Trade Prospects Improving

E. G. Wilmer, president of The Goodyear Tire & Rubber Co., upon his return from a two months' trip to South America, expressed the opinion that conditions are improving and that the future of American business in the southern continent is

very good. The general feeling as far as he was able to discover is exceedingly friendly to the United States and this feeling will do much to help American manufacturers in their efforts to obtain orders.

European manufacturers, and especially the Germans, are making every possible effort to regain their former trade and are making some headway. The exchange situation gives them an immense advantage over American manufacturers, but conditions may improve after the general elections to be held in March, according to views expressed by business men and bankers with whom Mr. Wilmer came in contact.

Crude rubber men in South America are looking for an eventual return of prosperity, but this, in the opinion of men with whom Mr. Wilmer talked, is contingent upon the building up of plantations for the growing of rubber rather than a revival of the crude wild rubber industry.

Regarding the reports that the Goodyear company will construct a rubber factory in Brazil, Mr. Wilmer said that nothing definite has been decided.

"The matter of this factory remains one of the many unsolved problems which the present administration inherited from the former organization. It is really not a vital problem, however, because the plant which was under consideration is not as large as is generally supposed, and was intended and will be intended, if built, to take care of the southern trade. This trade is increasing. Reports from our Brazilian distributors show that sales during December were the largest in the history of Goodyear in South America, and I believe that with consistent effort material increase in business will result during the next few years."

A Consolidation of Small Companies Being Considered

W. A. Johnston, president of the Rubber Products Co., Barberton, Ohio, at a recent dinner of Akron business men announced that the plan of consolidating a number of the smaller rubber companies is again being considered. During the period of prosperity when overhead expense and sales cost meant little, the plan was never carried through. However, it would be one way to reduce overhead expenses.

Mr. Johnston, besides being president of the Rubber Products Co., is also the builder of Barberton and Kenmore and is known to be a "consolidation" man. He also announced that during the last few months the entire pay and salary-roll of his company has been readjusted, with every employe and official taking cuts from 35 to 60 per cent, and that the entire organization took the cuts as a united effort to help the company meet present manufacturing and business conditions.

Price Cuts Reduce Total Value of Akron's 1921 Business

Akron rubber factories during 1921 sold a total of \$328,726,591 worth of goods, according to recently published figures. The companies employed during the year a total of 38,861 men and women and had a total pay-roll of \$68,340,256. The output of the same rubber factories for 1920 approximated \$544,000,000 out of a total industrial production in Akron of \$640,000,000.

During the year steel and iron manufacturers, made up largely of rubber factory equipment makers, sold a total of approximately \$13,000,000 with an employment of approximately 2,100 men and women.

The decline in rubber sales for the year is to a large extent explained in the same way that sales of individual rubber companies are accounted for, namely, because of the 40 per cent decrease in the price of automobile tires and other reductions in rubber goods prices.

At the same time it was officially announced by the Federal Census Bureau in Washington that for 1919 Akron was the second largest industrial producer in the state of Ohio, surpassed only by Cleveland. In that year the city outstripped all other cities, including Cincinnati, Columbus, Toledo, and others which are

larger and would naturally be expected to be larger industrial producers.

Lack of Credit Information

Several rubber company credit managers have stated recently that the lack of information regarding the credit standing of automobile tire dealers throughout the country has curtailed production at the factories, due to the new conservative policy whereby orders are rejected or decreased in case of doubt.

Many dealers who were financially sound before the period of depression were hard hit during the last year and one-half, and while many of them have again placed their business on a sound basis, this information is slow in reaching the credit managers. For this reason some of the dealers who are entitled to their old credits are having reductions made in orders and this has resulted in generally decreased sales throughout the industry.

Price Reductions Affect "Gyp" Tires

It is reported that many of the "gyp" tires which flourished during the period of prosperity and even during the period of depression, mainly because of price arguments, have begun to feel the effect of the price cuts on standard tires.

Trips to many of the rubber factories in Ohio, Indiana and Illinois by fabric and rubber company representatives during the early part of last month developed the fact that some of the newcomers in the industry to whom quality has meant very little are experiencing a definite falling off of orders. These orders, which, according to the reliable reports, are being lost to the "gyp" manufacturers, are naturally reverting to the manufacturers of standard tires.

Akron Notes

The Akron Engineering Co., serving a number of rubber companies as consulting engineers, reports that the majority of its clients are showing more activity and that in most instances production is being increased slightly. Several companies which had postponed further development have recently decided that conditions are propitious and are making plans for actual work.

The Miller Rubber Co., Akron, officially denies that the incorporation of the Miller Rubber Glove Co. by Charles R. Wetzel, for \$1,000, has any significance beyond the protection of patent rights on the manufacture of a certain glove. The incorporation does not mean that the company intends to go back into the dipped goods business which was sold out several years ago to a Cleveland company.

Sales of the American Rubber Co., Akron, for 1921 were equal to those of 1920, according to official announcement at the annual meeting. The balance sheet for the year was not completed in time for the meeting, but a preliminary statement shows net assets of \$1,781,859 and total liabilities, including notes and accounts, of \$523,393. Production remains close to normal. Preferred dividends have been paid during the year and probably will be continued. No definite action has yet been taken towards payment on common stock during the year as is anticipated by some of the directors of the company.

The Loewenthal Co., Chicago, Illinois, rubber reclaimers, has announced that the branch plant at Akron has been placed in operation and that prospects for increasing production are very good. The company has 25,000 feet of floor space along the Akron, Canton & Youngstown railroad tracks with options on a similar additional amount of space in case operations demand expansion.

The Mohawk Rubber Co., Akron, has announced that orders for January were 75 per cent in excess of those during the same month last year and that indications are that February will show the same increase over February of 1921. During the last month the plant has been placed on full time with one shift a day working nine hours. A number of men have been

added to the working forces. The company entered the year without a cent of indebtedness and arrangements made on fabric contracts place these in a satisfactory position. Rubber has been bought at the market for the last six months.

The Kelly-Springfield Tire Co. on February 1, reached peak production with three full eight-hour shifts in the Akron factory. Approximately 1,600 tires are made a day.

The Star Rubber Co. on the first of February increased production more than one-third, and further increases will be required with a continuance of orders at their present scale. During January the company oversold an average of 100 tires a day. The Akron plant is now making 400 tires a day.

The Interlocking Cord Tire Co., Akron and Mogadore, since reorganization has enjoyed such good business that plans to increase production to 800 tires a day by early fall and an immediate increase of 75 per cent over present production, are being considered by the company. Additional financing for the new equipment needed for the capacity increase is to be derived from collections on old stock subscriptions. No difficulty is being encountered in selling the product.

The Falor Manufacturing Co., Akron, is operating its plant to capacity, and if business continues to increase, a night shift may be made necessary and it may be necessary to move into larger quarters. Tubes are manufactured exclusively and distributed through a selling agency. Shelby Falor, president of the company, was formerly connected with The Goodyear Tire & Rubber Co. Capacity at the present time is 500 tubes a day.

Barney Oldfield has been reelected president of The Oldfield Tire Co., E. W. BeSaw has been renamed vice-president; B. M. Robinson, secretary; J. G. Robertson, treasurer; and R. S. Leonard, assistant treasurer. During the year the company has greatly increased its business through establishment of new distributors.

Ohio Notes

At the annual meeting of the stockholders of The National Tire & Rubber Co., East Palestine, Ohio, the following officers and directors were elected: C. L. Merwin, president; C. E. Miley, vice-president and general sales manager; C. W. Helman, secretary; R. B. Taggart, treasurer; P. C. Hartford, O. P. Smith, and C. F. Woods.

The Rubber Products Co., Barberton, Ohio, reports that its plant will go on a normal production basis some time during the month. January orders were a little above normal and February orders promise to be the same. The gain has been exceedingly steady. In the tire department strenuous efforts are not being made because of the present price situation. On the whole the company feels gratified with present conditions and future prospects.

John Morgan, president of The McGraw Tire & Rubber Co., 4810 Prospect avenue, Cleveland, Ohio, announces the appointment, effective February 1, 1922, of L. L. McAnaney as manager of the firm's Cleveland branch. Mr. McAnaney is thoroughly familiar with the rubber industry, having served in the sales divisions of rubber organizations for the past twenty years. His previous connections have been with the Goodrich and Republic companies, while for the last two years he has been covering Baltimore territory for the McGraw company.

J. H. McDonough has been appointed branch manager for the Firestone Tire & Rubber Co., Akron, Ohio, at Cincinnati, Ohio, from a similar position at Dallas, Texas.

At the headquarters of the American Zinc, Lead & Smelting Co., Columbus, Ohio, a convention was held January 24-25, where the subsidiary sales organizations of the company were represented, and plans for the year 1922 discussed. W. A. Ogg is president of the company, and L. E. Wemple general manager.

The Columbus Tire & Rubber Co., 555 West Goodale street, Columbus, Ohio, is now operating day and night shifts, with prospects for business greater than at any time since the plant was established in 1919. January sales for this year greatly exceeded those for December, and were five times greater than those for January, 1921. Officials of the company state that the production increase indicates an advance of 33 per cent since last August, and it is still growing. Stations for the distribution of the Columbus company's products are in practically every state in the Union.

The executive personnel of the organization is as follows: John W. Zuber, president; J. P. Brennan, secretary; W. A. Patterson, general manager; and M. J. Miscoe, general superintendent.

The Dayton Rubber Manufacturing Co., Dayton, Ohio, has appointed W. H. Hurley general sales manager. He has had 12 years' experience in the tire business, the last 3 of which have been in a similar position. Mr. Hurley will have entire charge of the development and supervision of the Dayton sales organization all over the country; of the development of sales, advertising, and service policies; and of the operation of the various factory branches. He will work in cooperation with R. F. Brown, recently appointed treasurer of the Dayton company.

W. J. Rennick has been recently appointed secretary and treasurer of The McKone Tire & Rubber Co., with headquarters at Millersburg, Ohio. It is also announced that the main offices of the McKone company, formerly at Chicago, Illinois, have been removed to Millersburg, the sales offices however to be maintained in Chicago, in the McCormick Building. For many years Mr. Rennick was associated with The Miller Rubber Co., more recently as assistant to the general sales manager.

At a recent meeting of the stockholders of the Liberty Tire Corporation, Carey, Ohio, seven directors were elected and the following officers chosen: M. E. Jordan, president; Irvin Jordan, vice-president and general manager; W. J. Ingram, treasurer; G. A. Rothrauff, secretary; and R. H. Brown, assistant secretary and treasurer. All of the last-mentioned officials have had much experience in the rubber industry, their previous connections having been with the Standard Four Tire Co., and the Firestone, Kelly-Springfield, Goodyear and Goodrich companies.

The new plant of the Miller Glove Co., Massillon, Ohio, is nearing completion and will be fitted with the best equipment obtainable for the manufacture of its goods. Rubber gloves and other goods for surgical use will be manufactured, as well as household rubber gloves and specialties. The concern comprises J. V., G. A., and Q. J. Miller.

The Ohio State Rubber Tire Co., Port Clinton, Ohio, formerly known as the Sandusky Tire & Rubber Co., went into receivership July 16, 1921. This plant with modern buildings and equipped with machinery of the most recent type, is valued at \$300,000. William J. Slater, of Akron, Ohio, is receiver for the company.

Studebaker-Wulff Acquires Marion Tire

The proposed purchase of the plant of The Rotary Tire & Rubber Co., Zanesville, Ohio, by the Studebaker-Wulff Rubber Co., did not materialize, owing to minor difficulties between creditors. The Studebaker-Wulff Rubber Co., has, however, secured the factory of the Marion Tire & Rubber Co., Marion, Ohio, this having been bought from Jesse P. Dice, of Akron, Ohio, as trustee.

The main factory building of the recently-acquired plant is of brick construction, 65 by 165 feet. There are three stories and a basement, with several adjoining wings, while necessary alterations and additions are nearly completed. The building is fully equipped with modern machinery, and is well stocked with supplies and raw materials of every description needed for immediate operation.

The Marion company formerly produced 300 casings and 800 inner tubes a day, and the Studebaker-Wulff company will continue manufacturing under the Marion brand at present. Later it will gradually develop the production of special cord tires to be known as Studebaker-Wulff Cords. The Marion plant is under the direct supervision of H. C. Buchanan, a director of the company, and formerly production superintendent for the Kelly-Springfield Tire Co. at Akron, Ohio. The other officers of the company are P. E. Studebaker, president; F. A. Rendon, vice-president; B. F. Wulff, secretary and general manager.

Maguire Forms Holding Company

The Maguire Tire & Rubber Co., recently incorporated under the laws of Delaware, has been organized for the purpose of consolidating small manufacturing companies under one operating head as a holding company. Automobile tires, tubes and similar products will be manufactured and sold, while the Corporation Trust Company of America, Du Pont Building, Wilmington, Delaware, will act as the concern's Delaware agent.

John W. Maguire, the president of this newly-organized company has been identified with the rubber industry for more than twenty years. He has served as Chicago branch manager of the Republic Rubber Co., Youngstown, Ohio; general sales manager of the Brunswick-Balke-Collender Co., Chicago, Illinois; vice-president and general manager of The Portage Rubber Co., Akron, Ohio; president of the Mid-West Rubber Manufacturers' Association, and a director of The Rubber Association of America. The development of the Maguire Tire & Rubber Co. will be noted with interest.

The Rubber Trade in the Mid-West

Annual Meeting and Dinner of Mid-West Rubber Manufacturers' Association

The regular monthly meeting and luncheon, and annual banquet of the Mid-West Rubber Manufacturers' Association brought together on January 31, at the Hotel Morrison, Chicago, Illinois, almost one hundred members of the rubber trade, who appeared thoroughly to enjoy the occasion.

At the luncheon the principal speaker was Edward S. Babcox, editor of *The India Rubber Review*, Akron, Ohio, who took as his subject, "The Rubber Outlook for 1922." Immediately following this address came the election of new officers and directors.

The evening banquet was an enjoyable affair, the leading address being made by Homer Buckley, Buckley-Dement Co., Chicago, Illinois. Mr. Buckley reviewed the question of sales, and also discussed transportation problems of today. At the conclusion of his speech he was given a rising vote of thanks.

Two companies were also elected to membership during this session: The DuBois Rubber & Tube Co., Chattanooga, Tennessee, and The New Haven Sherardizing Co., Hartford, Connecticut. The next meeting of the Mid-West Association will be held in Chicago again on the second Tuesday in March.

New Officers and Directors

At the annual meeting the following directors and officers were elected, and committee appointed:

President

W. W. Wuchter, general manager, Nebraska Tire & Rubber Co., Omaha, Nebraska.

First Vice-President

Thomas Follen, president, Lion Tire & Rubber Co., La Fayette, Indiana.

Second Vice-President and Treasurer

Sam J. Turnes, advertising manager, Brunswick-Balke-Collender Co., Chicago, Illinois.

Secretary and General Manager

C. S. Sutherland, 607 South Wabash avenue, Chicago, Illinois.

Directors**Terms Expire 1925**

Sydney J. Roy, general manager, Hannibal Rubber Co., Hannibal, Missouri.

Walter R. Denman, general manager, Denman-Myers Cord Tire Co., Warren, Ohio.

E. H. Bohlmann, superintendent of tire manufacturing, Cupples Co., St. Louis, Missouri.

J. B. Gabeline, president, Standard-Four Tire Co., Keokuk, Iowa.

Terms Expire 1924

Sam J. Turnes, advertising manager, Brunswick-Balke-Collender Co., Chicago, Illinois.

W. W. Wuchter, general manager, Nebraska Tire & Rubber Co., Omaha, Nebraska.

D. M. Mason, general manager, The Mason Tire & Rubber Co., Kent, Ohio.

Paul P. Parker, president, The Parker Tire & Rubber Co., Indianapolis, Indiana.

Terms Expire 1923

Thomas Follen, president, Lion Tire & Rubber Co., La Fayette, Indiana.

M. J. Flynn, treasurer, Inland Tire & Rubber Co., Chicago, Illinois.

Harry J. Smith, president, Achilles Rubber & Tire Co., Binghamton, N. Y.

D. L. Spraker, Kokomo Rubber Co., Kokomo, Indiana.

Ex-Officio Members of the Board for 3 Years as Ex-Presidents of the Association

John W. Maguire, president, Maguire Tire & Rubber Co., Cleveland, Ohio.

John T. Christie, president, Hawkeye Tire & Rubber Co., Des Moines, Iowa.

D. M. Mason, general manager, The Mason Tire & Rubber Co., Kent, Ohio.

Finance Committee

Sam J. Turnes Thomas Follen Sydney J. Roy

Midwestern Notes

Andrew Scharff, formerly in charge of the Minneapolis district of the Multibestos Co., Walpole, Massachusetts, has been appointed manager of the company's Chicago branch, with offices at 1430 Michigan avenue. This organization specializes in the manufacture of "Multibestos" brake and clutch linings.

C. T. Barnes, formerly branch manager of the Firestone Tire & Rubber Co. at Indianapolis, Indiana, has been placed in charge of the Chicago, Illinois, branch of the company. He succeeds William Fitzgerald, appointed manufacturer's representative.

B. R. Barva has resigned from the presidency of the Wedge Heel & Rubber Co., Inc., Fort Wayne, Indiana, and J. B. Franke has been elected to succeed him. The Wedge Heel & Rubber Co., which manufactures "Twin Star Wedge" heels, was recently incorporated at \$100,000. The plant capacity was soon doubled, and during January last funds were appropriated which will increase the factory equipment approximately fifty per cent. D. M. Vesey is general manager of the organization, and F. T. Wichman general sales manager.

As the result of heavy operating losses in 1920, the directors of the Racine Auto Tire Co., Racine, Wisconsin, recently filed a voluntary petition in bankruptcy. Conditions during 1921, however, showed a decided improvement, and warrant, it is now stated, the immediate resumption of factory operations. H. O. Smith is receiver for the company.

The Corrigan Tire Co., 2740-50 McGee Trafficway, Kansas City, Missouri, which was incorporated under the laws of Missouri

on September 8, 1921, and capitalized at \$75,000, is now operating at the above address, and is selling Hood tires and tubes. Edward J. Corrigan is president of the company.

The Buckeye Rubber Products Co., Willoughby, Ohio, has opened a branch office for the sale of Polack solid tires at 1826 Baltimore avenue, Kansas City, Kansas. The Buckeye company also manufactures mechanical goods.

Announcement has been made of recent changes in the executive personnel of the Hunter Dry Kiln Co., 26th and Cornell avenues, Indianapolis, Indiana. These include the election of O. M. Ragsdale to the presidency of the company, while Paul R. McCampbell is now vice-president, and E. C. George, secretary-treasurer.



Paul R. McCampbell

The firm has recently placed on the market an improved model of the Hunter system of drying and processing rubber, and the introduction of this system into Europe is meeting with much success. Mr. McCampbell, who as a captain during the war spent two years in France, will sail for that country and England in order to supervise there the installation of the new process.

A factory and retail tire store are being maintained by the Holmes Rubber Co., whose main offices are in the factory building, 1500-1518 West 15th street, Chicago, Illinois. The store address, also in Chicago, is 2130 Michigan avenue. Holmes tires are rebuilt and sold by this organization, whose executive officers are: J. L. Holmes, president; R. A. Norton, vice-president; and E. A. Holmes, secretary and treasurer. The company was incorporated under the laws of Illinois on October 29, 1921, capitalized at \$25,000, this capitalization having been increased on January 18, 1922, to \$150,000.

The Rubber Trade on the Pacific Coast Manufactured Goods

While activity has been especially noted in the tire trade during the past month, other rubber lines less in the limelight have also been experiencing a favorable run of business in the last few weeks. This is particularly true of the shoe trade. The Pacific Coast distributors of rubber footwear and rubber-soled shoes have been exceptionally busy delivering the large stocks that have recently been forwarded by eastern manufacturers, and, to give them further concern, a sudden and considerable demand for more goods of the same kind has sprung up nearly all along the Coast. Part of the demand is due to unusually wet weather, and most retailers are very urgent, evidently believing that the winter rains will continue much longer this season than usual; but the demand is also strong from jobbers who supply big ranches, lumber districts, concrete building and other concerns. The mines are finally sending in long-promised orders for heavy rubber footwear. Every week witnesses increased activity among the mines in the Southwest, and in Arizona especially, where the long shutdown of the copper mines proved a serious blow to the state, it is reported that every mine of importance with the exception of one has resumed active operations, which indicates improved demand for mechanicals.

Mining concerns are also coming into the market for transmission, conveyor, elevator, and other rubber belting, as well as for various kinds of hose, packings, etc. Demand for mechanical rubber goods from the oil industry has eased up somewhat, the only explanation given being that the companies are well equipped for the present, although it is said that ample production of oil and the present low price of crude also account for the lessened inquiry for rubber goods and other supplies. Mechanicals for building trades are fairly active, and as soon as more settled

weather is assured they are likely to be in lively demand. A very good sale of druggists' sundries is reported by the branches of the eastern factories.

Every tire factory on the Pacific Coast appears to be doing well, and some are exceptionally busy. All the larger eastern companies which maintain branches in Seattle, Tacoma, Spokane, Portland, San Francisco, and Los Angeles report a marked improvement in sales, most buyers taking on all they could afford under the 90 days' dating plan expiring March 1.

Los Angeles

Executives and employees of the Goodyear Tire & Rubber Company of California were not a little proud of the arrival recently at the big plant at Ascot Park, Los Angeles, of a cargo of 1,000 tons of crude rubber from the Goodyear plantation at Dolak, Merangir, in Sumatra. It was the largest consignment of crude that has yet been received through Los Angeles harbor, and consisted of 10,082 cases of pale crepe, brown crepe and ribbed smoked sheets, worth about \$600,000, and had been transhipped at San Francisco. Thirty-six cars were used in moving the load from wharf to mill. The Goodyear company has assurance that in a few months all shipments of crude can be made directly to Los Angeles, as the Pacific Mail and other steamship lines are planning for such service.

Exporters of rubber tires were much encouraged with the announcement by the Southern Pacific railroad of a substantial reduction in freight on tires shipped from Mid-West points to the Pacific Coast for export, effective February 15. West Coast branches and jobbing concerns, as well as tire makers in this section, are closely watching trade developments in the Far East, and they intend to get a fair share, if possible, of the business that is steadily growing in India, China, the Philippines, and other trans-Pacific countries. The lowered freight rate, however, deprives some of the Pacific Coast tire makers of an advantage they enjoyed over the Mid-West tire makers in export business.

The new Seiberling Rubber Co., Akron, Ohio, has selected Los Angeles for its Pacific Coast headquarters, with J. E. Argus as general manager and these branch managers for the western territory: George Bellis, Los Angeles; F. B. Hesse, San Francisco; C. B. Reynolds, Portland; M. H. Anderson, Salt Lake City; and J. M. Watson, Denver. The temporary Seiberling company office in Los Angeles is at 1221 South Hope street. Messrs. Argus and Bellis are old Goodyear sales and branch managers.

Los Angeles has not given up hope of getting the Federal Government to establish a free port at the harbor in the San Pedro section, and to keep the project in the forefront the Chamber of Commerce has appointed an energetic committee of which A. F. Osterloh, vice-president and general manager of the Goodyear Tire & Rubber Company of California, is a member.

The Pacific Rubber Co., 415 East 8th street, Los Angeles, of which Roy R. Meads is president, one of the largest tire distributors on the coast is reported to be arranging for the manufacture in the East of a tire bearing its own name. Mr. Meads, who has been in the East for several weeks, will make an announcement about the tire shortly.

The Imperial Cotton Mills project, which was first mentioned in *THE INDIA RUBBER WORLD* several months ago, is now being launched publicly. The financing involves the sale of \$1,500,000 stock, of which none is for promotion, and a heavy subscription is reported so that work on buildings will be justified in perhaps a couple of months. The enterprise may mean much to rubber manufacturers who can utilize various textiles which the new concern plans to make on an extensive scale, and the company hopes to compete readily with eastern mills.

The offices of the company are 816-820 Loew's State Theatre Building, Los Angeles; and the officers are F. M. Douglas, W.

L. Williams, Samuel L. Deane, and Glenn B. Chadwick, secretary. Thomas W. McDewitt and Benjamin F. Miller are directors.

The Upton Tire Co., 236 South Figueroa street, has just taken the Los Angeles agency for the Coast Tire & Rubber Co., Oakland, California.

C. A. Tracy, long in the service of the Hood Rubber Co., Watertown, Massachusetts, in Southern California, Arizona, New Mexico, and Old Mexico, has been appointed Pacific Coast manager of the hard rubber sales of the Hood company, with headquarters at 1223 South Olive street, Los Angeles. He is specializing on hard rubber battery jars and a new product, a hard rubber battery box, and during the past few weeks has been in the Northwest studying the field.

Earl E. Hazelrigg, chemical engineer, who was trained at the Goodyear factory, Akron, Ohio, and had latterly been manager of repair material sales at the Spreckels plant, has been appointed manager for The Spreckels "Savage" Tire Co., San Diego, at its branch at 406 West Pico street, Los Angeles.

San Francisco and Vicinity

"Business is always good with us," is the report of the Pioneer Rubber Mills, San Francisco. The plant at Pittsburg, Contra Costa County, California, is being continually extended and in some departments considerable new equipment has recently been added. Some of the force is working in three shifts daily. An especially busy section is that devoted to garden hose on which the unfilled orders now reach a large total. The special press used in this department, said to be the largest west of Chicago, has recently been put in a more efficient condition than when installed a few months ago. The company is about to deliver to Los Angeles 7,500 feet of 2½-inch double-jacketed cotton fire hose.

The Cooper-California Company, of which Harry C. Falkell is president, has been appointed in San Francisco as Pacific Coast distributor for the Cooper Corporation, Cincinnati, Ohio, manufacturers of batteries, tires and tubes; and will also represent the Las-Stik Patch Manufacturing Co., Hamilton, Ohio, on the coast.

Ralph H. Daniels has succeeded Frank E. Carroll as manager of the San Francisco branch of The Goodyear Tire & Rubber Co., Akron, Ohio.

The India Tire & Rubber Co., Akron, Ohio, includes the firm of Warren & Richards, Sacramento, California, as the latest addition to its list of tire dealers. This last-mentioned concern is said to have larger accounts than any other similar establishment in this western city.

George F. Shugart, vice-president and general sales manager of the United States Rubber Co., has been spending several weeks studying trade conditions in San Francisco and the Northwest and Southwest, being accompanied on his visits to various branches by J. B. Brady, general manager, Pacific Coast division of the company. Mr. Shugart expresses himself as very optimistic about west-coast trade generally and says that his company's affairs are in fine shape in all the western territory.

The Coast Tire & Rubber Co., the new Oakland concern, of which Alfred Aya is president, reports that it has all it can do to fill orders for its cord tires, and is expecting to enlarge its plant in the near future.

Northwestern Notes

The Columbia Tire Corporation, 1401 Northwestern National Bank Building, Portland, Oregon, has taken title to the 7½-acre tract recently secured in the North Portland district and, as soon as the weather permits, will start building the first unit of its plant.

A lively demand for mechanicals is keeping the Huntington Rubber Mills—formerly the Portland Rubber Mills—corner of Macadam and Nevada streets, Portland, Oregon, quite busy. H. C. Huntington is president and general manager.

Jack Tire & Rubber Co., Spokane, Washington, reports its present capacity is 500 tubes and 500 tires daily. It manufactures both cord and fabric tires in a modern plant equipped with up-to-date machinery. The company was incorporated under the laws of Washington, September 16, 1921. T. G. Richards is president and general manager; John B. White, secretary and treasurer; William E. Greer, superintendent. Offices are in the Paulsen Building, Spokane.

A good trade in tire repair materials, rubber cement, and other rubber goods manufactured by the Swanson Supply Co., 2124 Westlake avenue, Seattle, Washington, is reported by that concern.

Business is reported very good by the Sound Rubber Co., 6220 South Union avenue, Tacoma, Washington, which is actively planning to increase its tire output to 500 casings daily.

Another rubber manufacturing concern is being launched in Seattle, Washington, where the Northwestern Rubber Co. was incorporated recently with \$100,000 capital. The active agents in the concern are E. Elliott and W. L. Lanning.

Syra-Cord tires and tubes will be distributed in Western Washington by the Miller-Lowe Tire Co., Seattle. Mr. Lowe's interest has been bought by C. J. Ernst, Jr., recently motorcycle tire division manager at the Goodyear factory, Los Angeles.

Southwestern Notes

The Spreckels "Savage" Tire Co., San Diego, California, has adopted for 1922 the new adjustment or standard warranty form approved by the Tire Manufacturers' Division of The Rubber Association of America, Inc., in which the guaranty is to be based on merit instead of mileage. Business is reported excellent at the plant. Gordon Pratt is the new office manager.

The wholesale branch of the Goodyear Tire & Rubber Company of California at Phoenix, Arizona, has been reestablished in charge of E. L. Falls, who has been at the Los Angeles headquarters. D. M. Anderson is district representative.

Tire repair men in the Southwest still complain that the recent reductions in new tire prices have also reduced their work considerably. Incidentally sales of repair materials and equipment have slowed up, too.

A third removal to larger premises is reported by the Southwestern Supply Co., of Oklahoma City, Oklahoma, distributor for the Lee Tire & Rubber Co., whose main offices are at 245 West 55th street, New York, N. Y. The new accommodations of the Oklahoma City branch are at 718 North Broadway. The business is in charge of Earl W. Bentley, who founded the Southwestern Supply Co., and is still its president and general manager. Another distributing station in Oklahoma for the Lee Company is at Tulsa, Oklahoma.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, reports a lively demand for its products in the Southwest. It moved into a new building of its own, a well equipped 90 by 100-foot structure, at 1224 Fourth street, San Diego, during the past month.

"Very busy filling an unusual demand for cord tires," is the report from the Spreckels "Savage" tire factory, San Diego. The company recently established a very complete research department, and M. F. Low has been put in charge.

Much interest in rubber and asbestos circles is attached to the statement that the Johns-Manville and other large asbestos producers are planning for the early resumption of work in the large mines north of Globe, Arizona, and that before long the state will again be the largest producer of asbestos in the United States.

Arizona cotton growers are this year for the first time experimenting with cooperative marketing. Out of a total crop of 30,000 bales, 10,000 bales have been assigned to the Arizona Pima

Cotton Growers' Association, which recently sold 1,000 bales at 33½ cents a pound. It has recently established warehouses in the East where spot cotton can be contracted for directly by the mill owners. A gradual improvement in cotton prices is looked for by the southwestern growers on account of the reduced Egyptian crop.

George Housaman, formerly of New Orleans, Louisiana, succeeds J. H. McDonough as branch manager at Dallas, Texas, for the Firestone Tire & Rubber Co., Akron, Ohio.

Rubber Association of Canada—Annual Meeting and Dinner

At the annual meeting of the Rubber Association of Canada, held February 14, 1922, in Montreal, the following officers were elected: President, W. A. Eden; vice-president, C. N. Candee; Treasurer, John Westren; manager and secretary, A. B. Hannay. The board of directors includes: C. H. Carlisle, C. N. Candee, W. H. Miner, F. W. Partridge, J. Westren, R. F. Foote and A. R. Kaufman.

Second Annual Report

In presenting the second annual report of the association A. B. Hannay, manager and secretary, referred to the surprising strength which had been shown by the Canadian rubber companies in absorbing losses upon their materials and manufactured stocks, and also in adjusting themselves to a decline in demand for their products. The confusion which had developed in the great rubber industry in the United States had made the Canadian problem more complicated, but nevertheless the outlook for the future indicated steady improvement in Canadian rubber business, both at home and abroad. Tariff revision and statistics regarding tire and tube production were discussed, while the question of highway improvement was also considered. A statistical survey of the Canadian rubber industry for the past two years is being prepared by the association.

Annual Banquet

The annual banquet, also held February 14, at the Windsor Hotel, Montreal, was well attended, a number of delegates from the United States being present. These included: Paul Litchfield, The Goodyear Tire & Rubber Company, Akron, Ohio; J. S. Lowman, Philadelphia Rubber Works Company, Akron, Ohio; and J. F. McLean, Pequannoc Rubber Company, Butler, New Jersey. A representation of crude rubber brokers from New York City also attended. Addresses were made by the Honorable A. B. Copp, Secretary of State, and the Reverend George Adam, of Montreal.

The president-elect, W. A. Eden, vice-president of the Canadian Consolidated Rubber Co., Limited, was given a splendid reception when introduced by the passing president, C. H. Carlisle, of The Goodyear Tire & Rubber Company of Canada, Limited.

CANADIAN NOTES

Good conditions for business are reported by the Transparent Rubber Goods Co., Limited, manufacturers of high-grade rubber sundries, with offices and works at Eastern and Carlaw avenues, Toronto, Canada. This company specializes in the production of druggists' sundries, including transparent nipples, and has also had recently much demand for toy balloons. Preparation has lately been made and equipment installed for the manufacture of all kinds of rubber gloves. E. Barringham is president of the company.

P. C. Hagerty, one of the pioneers of the Canadian tire industry, is now with J. T. Wing & Co., Limited, Pitt Street, East, Windsor, Ontario. This firm is acting in the counties of Essex and Kent, Ontario, as distributor of tires and tire accessories manufactured by the well-known Toronto firm, Gutta Percha & Rubber, Limited.

The Rubber Trade in Great Britain

By Our Regular Correspondent

Institution of Rubber Industry

A PAPER, "Vulcanization: Past, Present and Future," was given by Dr. Philip Schidrowitz at the January meetings held in London and Manchester. Owing to the author's inability to make the journey the paper at Manchester was read by H. L. Terry. Abstracts from this paper are reprinted on another page of this issue.

Neither in London nor Manchester was the discussion on this paper lengthy or particularly instructive. Specific reference had been made to tires, and although I cannot speak concerning the London audience, tire experts certainly did not abound at the Manchester meeting. Mr. Terry complimented the author on having left out of his list of vulcanizing processes, various patents which have done duty far too long in the books on manufacture, but which as far as he could gather have never been put into practice. He presumed that the reason why so many unworkable patents found an abiding home in rubber literature is because it is so rare for any manufacturer or expert to condemn them.

Some discussion took place at Manchester on the use of the sulphur bath and it was clear from the references by speakers to their individual experiments that the procedure long ago established by those few firms which have used the process for years for certain classes of goods still remains in the list of those recent processes from which it is one of the avowed objects of the institution to draw aside the veil.

Another paper read at the Manchester meeting, where Fordyce Jones was in the chair, was "Rubber Works Worries," by Captain F. J. S. Gray. The subject was dealt with under the heads of the factory, equipment, supplies and labor, and in many directions ideas for improvement were thrown out and elaborated. With regard to equipment it was pointed out that the American works replaced their machinery with up-to-date types much more promptly than we do.

The familiar topic of variation in plantation rubber cropped up and the author has evidently no doubt in his mind as to the existence of the evil. No one today, he said, would buy plantation rubber without a scruple as was the case with fine hard Pará, and the growers will have to follow a uniform method for the production of say three grades—first latex, smoked sheet, and crêpe. Such standardization will come about eventually in spite of the growers' statements that it is impossible and the manufacturers will be relieved of one of their greatest worries.

In the subsequent discussion it was stated by one expert in the cable branch that the electrical resistance test of fine hard Pará put plantation rubber into the shade and by another that plantation rubber is certainly not equal to the best wild Pará. Messrs. J. H. Mandleberg, Payne, and Penny spoke on the subject of the American disregard for secrecy. Mr. Payne thought that the Institution will not get English ideas and procedure altered, though Mr. Mandleberg appeared to be more optimistic. The author in his reply stated that the dimensions secrecy takes in England are indeed stupendous, and added the somewhat cryptic remark that, given time and money, all processes can be obtained.

Magnesium Carbonate and Oxide

In the interesting article on magnesium carbonate as a compounding ingredient in rubber, in THE INDIA RUBBER WORLD for November 1, 1921, reference is made to the long-known use of the oxide as an accelerator, and it is stated that rubber manufacturers do not seem to have given the carbonate much attention. This hardly corresponds with the facts in English practice. In only

a few cases did the oxide of magnesium displace lime as an accelerator, say twenty years ago, while at that period the use of the carbonate increased very largely as a filler in a limited number of goods, and especially in solid tires in the last decade. At the commencement of the war the demand for the carbonate became very great and those who were interested in its sale had a bitter pill to swallow when it was replaced by carbon black and the demand fell off very considerably. The object of the carbonate was to produce a tough rubber and also to act as a light inorganic filler. The article refers to its manufacture as a bulky precipitate by boiling a solution of the bicarbonate. By this process the best and most uniform product is made, but it is also made by precipitating a solution of a magnesium salt with sodium carbonate solution. Obtained in this way the composition does not seem to be so regularly uniform and this may account for the variations referred to by Dr. Pickles in his paper before the Institution of Rubber Industry, in the discussion on which this variation was denied by at least one speaker.

Pentasulphide of Antimony

Any information as to the chemistry of this rubber chemical is interesting, and all the more when it comes from the laboratory of the North British Rubber Co., Limited, by the agency of Dr. Luff and Mr. Porritt. It is somewhat startling after all these years to hear that there is no such body according to Kirchhof. But whether it exists or not it is now shown that it is not essential, as a satisfactory golden sulphide of antimony may consist entirely of the trisulphide, the pentasulphide being conspicuous by its absence. The main thesis of the paper is the correct determination of the free sulphur, and the carbon bisulphide method which has been condemned by some author is shown to be reliable. It is also shown that over and above the free sulphur which is present more sulphur is liberated from the pentasulphide at the vulcanizing temperature, and it is suggested that available sulphur should be determined after the sample has been heated to 150 degrees C. for five hours in a slightly alkaline atmosphere.

Rubber for Cold Store Insulation

Arising out of war-time needs a government inquiry was made into the value of different insulating materials for cold stores and in a recent report issued by the National Physical Laboratory special reference is made to the good results obtained in preliminary tests of expanded rubber as a substitute for cork, charcoal, clay, wool, etc., the materials now ordinarily employed. Naturally this report has been hailed with pleasure by the numerous people, not to say associations, who are out to push new uses of rubber, and special prominence has been given to the subject by a leader in the *Times*.

The particular rubber which was tested was the expanded rubber which was shown at the late Rubber Exhibition under the name of Onazote and is patented by C. L. Marshall. This rubber differs from ordinary sponge rubber in texture and weight, being vulcanized under a pressure of, it is said, 100 atmospheres. The product in this case has its air cells unbroken, while ordinary sponge rubber is porous and absorbent, owing to broken cells. It is stated that the weight of the expanded rubber is only about half that of slab cork.

The *Times* concludes its report by saying that the future of this new use for rubber rests with the rubber manufacturers, but the writer seems to overlook the fact that this rubber is a patent and is not being made by all and sundry under competitive conditions. Again in none of the press references I have seen is there

any reference to the price. Even supposing that its superiority to slab cork is proved beyond doubt—and this is not accepted, I may say, in certain practical quarters—how is it going to compete in price and longevity? I cannot vouch for the figures myself, but I am told that a slab of cork about one foot square and an inch thick costs about one shilling, while a similar-size piece of expanded rubber would cost about twelve shillings. I think it may be taken that the rubber will cost a good deal more than cork and this fact must not be overlooked. It is interesting to note that Mr. Marshall claims to have recently improved on Onazote in Thermozote, which weighs only three pounds to the cubic foot and is now under test for its insulating properties.

India Rubber Manufacturers Association

The chairman, Stuart A. Russell, presided at the annual meeting held at the headquarters, Manchester, in January, and in moving the adoption of the report dealt in an interesting manner with some of its main items. The past year he said has been a very difficult one, but he believes the worst has been seen and that the demand for rubber goods will increase by reason of lower costs of production, both in regard to labor and material, aided by improvements in processes of manufacture coupled with greater economy in all oncost and overhead charges. Reference was made to the discontinuing of the meetings of the National Joint Industrial Council and to the present method of fixing wages locally or by districts, a procedure which had been found to work satisfactorily. Other spheres of activity were railway rates and charges, foreign tariffs, taxation and revaluation of stocks, the Key Industries Bill and the Workmen's Compensation Act.

A specially important matter dealt with by the association was the proposed regulations dealing with lead compounds and fume processes (cold cure) in rubber works. This matter was referred to some months ago in this correspondence and it is interesting to learn that the Home Office has accepted substantial modifications of the draft scheme submitted to the trade. The main attractions are that the regulations with respect to lead compounds do not go beyond the mixing process, and the regulations as to the fume process are limited to carbon bisulphide, though where benzene is used a standard of general ventilation of 30 changes of air per hour has to be maintained.

With regard to the railway rates and classification of goods, a sub-committee with F. Webster as chairman, had been actively engaged in conjunction with the British Rubber Tyre Manufacturers' Association, and Mr. Webster's services were warmly eulogized by the chairman. The main note of regret in Mr. Russell's speech was in his announcement that R. T. Pelly, the recently appointed secretary of the association, who won such high distinction in the war, has resigned in order to rejoin his old firm, Steel & Radiation, Limited, in Canada.

The new chairman of the association is E. Healey (W. & A. Bates, Limited) and the new general committee is as follows: P. A. Birley (Charles Macintosh & Co., Limited); D. C. Campbell (Campbell Achnach & Co., Limited); H. C. Coles (Wm. Warne & Co., Limited); Colonel J. Gardiner (Rubber Co. of Scotland, Limited); H. W. Hatton (Premier Waterproof & Rubber Co., Limited); E. Healey (W. & A. Bates, Limited); J. Henderson (Ancoats Vale Rubber Co., Limited); F. W. Hinde (Avon India Rubber Co., Limited); A. D. Ingram (J. G. Ingram & Son, Limited); Alexander Johnston (North British Rubber Co., Limited); Sir G. Charles Mandleberg (J. Mandleberg & Co., Limited); D. Moseley (David Moseley & Sons, Limited); C. R. Quartley (George Spencer-Moulton & Co., Limited); T. C. Redfern (Redfern's Rubber Works, Limited); S. T. Rowe (Greengate & Irwell Rubber Co., Limited); S. A. Russell (India Rubber & Gutta Percha Telegraph Works Co., Limited); J. Tinto (Greengate & Irwell Rubber Co., Limited); F. Webster, co-opted (Avon India Rubber Co., Limited).

J. T. Goudie, R. Moseley, and J. Tinto will serve as the Finance Committee.

The Rubber Trade in Europe

By Our Regular Correspondent

France

At a general meeting of the Etablissements Bergougnan, held at Clermont-Ferrand, a gross dividend of 40 francs per share was declared. This, together with interest already distributed, amounts to 65 francs a share of the old issue and 52.50 francs for each new share. Profits for the year amounted to 11,159,319 francs, compared with 10,940,329 francs for the previous year. The profits are chiefly due to the fact that the company turns out a variety of rubber articles. Reports from the Italian branch of this firm indicate that conditions have become normal; the Belgian branch has commenced producing; that in America has continued to be hindered by low selling prices and high rates of exchange; and the Russian factory will soon resume activities. The Société Caoutchouc de l'Indo-Chine supplies raw materials to the Bergougnan company.

The Société Industrielle des Téléphones reports profits of 7,015,000 francs against 4,120,000 francs during the previous year and a dividend of 40 francs against 35 francs was declared. The situation of the company, which manufactures cables and telephonic apparatus, is very satisfactory, the assets being 51,575,000 francs against liabilities of 27,785,000 francs.

The capital of the Compagnie Française des Câbles Télégraphiques has been increased from 16 million to 24 million francs by an issue of 32,000 new shares at 250 francs nominal.

The report of the Electro-Cable Company shows gross profits amounting to 5,177,219 francs and net profits of 1,611,910 francs. It has been proposed to declare a dividend of 55 francs.

The Compagnie Forestière Sangha-Oubangui reports that considerable quantities of stock were held over during the past year. Thus of 758 tons of rubber produced, 627 tons were sold.

The Société Chimique du Caoutchouc has just issued 1,000 new shares at 500 francs each, so that its capital, formerly 1,700,000 francs, is now 2,200,000 francs.

French Rubber Market

The Société des Produits Coloniaux (The Colonial Products Company) has arranged with a number of producers to make direct rubber shipments which will be sold publicly once or twice a month at the Bourse du Commerce of Paris by a sworn broker. Sales will be made in francs per kilo and result in a national market in which prices will be established only by the law of supply and demand. The broker who will handle these sales will be M. Levy Haussmann of Paris.

Sweden

Aktiebolaget Galoscher, Malmö, Sweden, has just been formed with a capital of 100,000 kroner, to take up wholesale dealing in rubber shoes.

Switzerland

Under the name Continental Caoutchouc Compagnie A.-G., a company, capitalized at 500,000 francs, has been established at Zürich, which will open branches at Berne, Geneva, St. Gallen. The aim of the company is to sell all kinds of rubber goods, particularly automobile and bicycle tires, and to represent the Continental Caoutchouc & Gutta Percha Co., Hanover.

Belgium

The commercial museum of Belgian Congo, annex to the Rubber Museum of the Association des Planteurs de Caoutchouc at Antwerp, was recently inaugurated. A number of well-known rubber men attended, among them being Emile Grisar, who presided in the absence of Edouard Bungé, president of the above association; Paul and Leon Osterrieth, Robert de Decker, Dr. E. De Wilde-man, and Gaston de Decker. The new museum will partake of

the nature of a bureau of information aiming to disseminate knowledge of the Belgian Congo and reviving demand and offer for its products. Merchants and manufacturers, preferably Belgians, will also exhibit merchandise and products needed in the Congo. Catalogs, periodicals in all languages, and a library will be at the disposal of the public.

At the opening of the museum various products of the Congo were on view and exporters had stands displaying different articles in demand in the colony. La Société pour le Commerce et l'Industrie du Caoutchouc, Société Colonial Rubber, and Cheysen & Co. had stands representing rubber goods manufactured in Belgium.

Germany

The German rubber industry during 1921 experienced conditions never before known since its existence. In some respects conditions were considered worse than those prevailing during the war. Transportation and communication inland have been giving much ground for complaint. Telegrams often came in after letters confirming them and long-distance telephone communications often have to wait till the next day. The coal shortage, due to lack of transportation facilities, is acute and many firms have to use coke and earthy brown coal briquettes.

Labor is expensive and not so efficient as it might be. The eight-hour day is quite evidently a thorn in the flesh of manufacturers, and complaints are heard about the inefficiency of the younger workers. The small difference in pay of the skilled and unskilled laborers discourages the desire to spend time in learning a trade. Then, of course, strikes have been frequent and often of long duration.

As for business, the year opened quietly and with little activity which did not cause anxiety as it was understood the return to normal would be slow. However, the sudden drop in the value of the mark entirely upset trade conditions; raw material prices soared, manufacturers changed prices every few days, and were overwhelmed with orders.

In December the mark recovered to a certain extent and now the reaction is beginning to set in; already one hears of panic orders being cancelled. Buyers are commencing to hold off in the expectation of lower prices, but for the present this seems to be impossible as the full effect of the sudden spurt in the cost of raw materials has not had time to make itself felt.

There are those who warn that the reaction after the abnormal boom will be of the worst kind. More than one experienced business man is of the opinion that the immediate outlook is disturbing. On the other hand others say that much depends upon the decision at London regarding the reparations, also that people must buy again when their stocks give out—although pessimists point out that people may have to do without things. All, however, are determined to keep up their courage and do their best.

German Notes

The Mitteldutsche Gummiwarenfabrik Louis Peter A.-G., Frankfurt a. M., proposes to declare a dividend of 35 per cent. This compares with 27 per cent the year before.

The Vereinigte Gothania-Werke A.-G., Gotha, intends to increase its capital by issuing new stock up to 4,500,000 marks, thus bringing its capital up to 11,000,000 marks. Business with this firm is reported as being good; orders are plentiful.

The Gummiwerke Neckar Aktiengesellschaft Friedrichsfeld, Schwetzingen, will double its capital, which will then amount to 10,000,000 marks.

The Deutsche Kabelwerke Aktiengesellschaft, Berlin, has raised its capital to 44,000,000 marks by issuing 20,000,000 marks capital and 2,000,000 marks preferential shares. From January 1, 1922, the tire department of this firm will work as an independent concern under the name Deka Pneumatik G. m. b. H.

The Norddeutsche Gummi- und Guttaperchawaarenfabrik, formerly Fonrobert & Reimann Aktiengesellschaft, Berlin, has raised its capital by 4,000,000 marks to 10,000,000 marks.

The Deutsche Dunlop & Co., A.-G., Hanau, will increase its capital by 9,000,000 marks to 12,000,000 marks.

The Mannheimer Gummi-Guttapercha und Asbestfabrik A.-G., Mannheim, has decided on the increase of its capital which will now be 4,800,000 marks. The new shares amount to 1,500,000 marks.

The Vereinigte Gummiwaaren Fabriker, Harburg, Wien, formerly Menier J. N. Reithoffer, Harburg, a. E., reports net profits of 5,804,835.18 marks for the past business year. A dividend of 16 per cent and a bonus of 10 per cent were declared. The first part of the year proved unsatisfactory but the large turnover later on was responsible for the profits. The Austrian branch seems to have had a particularly disagreeable time of it. There was a lack of necessary materials so that the factories could not work to full capacity. Besides this, the sudden downward tendencies of the krone entailed increases in wages and upset all calculations of export prices.

New Shoe Press

A new shoe press to be used in repairing rubber shoes and leather shoes with rubber soles has just been patented by the Dampf-Vulkanisier-Anstalt für Auto-Pneu-Reparaturen, Hans Kelch, Kötzschenbroda. It consists of a lower part of wood formed like the sole of a shoe. This part is hollowed and in the cavity is a rubber air cushion with a valve to regulate the air. A piece of strong linen is spread over the cushion to allow better resistance to the air pressure. On this linen the shoe with the gummed-on sole is mounted by means of two frame screws. By compressing the air in the cushion to 3 atmospheres and more the sole is evenly and firmly attached to the shoe without any forms other than the last.

Austria

The Favorit Gummiwarenerzeugungsgesellschaft m. b. H., XVI., Vienna, is a new firm with capital of 240,000 kronen, which will manufacture and repair tires and other rubber goods, manufacture technical and surgical rubber goods, and will also deal in these goods.

The Industrie und Bergbaubedarfs A.-G., III, Vienna, will deal especially in all kinds of necessities for home and foreign industrial and mining undertakings. The capital amounts to 20,000,000 kronen.

European Notes

The Pressburger Kabelfabrik, together with the Wiener Bankverein, will open a new cable factory at Budapest, Hungary.

The Società Italiana Pirelli, Milan, has increased its capital from 100 to 120 million lire.

Lechner & Co., Amsterdam, Holland, has lately been formed to deal in crude rubber.

GERMAN TRADE LIMITATIONS AFFECT BELGIAN TIRE SALES

As a result of limitations set by German authorities on Belgian exports to their country sales of Belgian products have been seriously retarded. Remarking on the 1921 decrease in tire sales to Germany a recent issue of *Commerce Reports* states:

Belgian tire sales to Germany in 1913 totaled 85,050 kilos, with a value of 1,100,546 francs. After the armistice, as the production capacity of Belgium manufacturers was restored and before raw materials could be secured in Germany, Belgian tire exports eastward were unusually large, showing for 1919 a bulk of 317,973 kilos and a value of 8,021,668 francs, and for 1920 a total weight of 478,044 kilos, valued at 12,671,250 francs. The immense relative decrease in 1921 is obviously due not only to the license régime but also to the gradual covering of abnormal needs and the increase in output of German firms, which are not only producing large quantities but also imitating American cord and special tread tires. Belgian tire sales in Germany from January to July, 1921, weighed only 31,895 kilos and were invoiced at 601,270 francs.

Foreign Tariffs

Austria

The Austrian Government now demands payment of import duties in gold on pneumatic casings and tubes. The duty is 150 kronen for 100 kilograms.

British India

Among the revised valuations in customs duties levied on the exports and imports of British India, the following were noted:

No.	Names of Articles	Tariff Valuation	Duty Per cent
121	Pneumatic rubber tires and tubes for motor cars, motor lorries, motor cycles, motor scooters, bicycles and tricycles.....	Ad valorem	20
126	Rubber tires and other manufactures of rubber, not otherwise specified (see No. 121).....	Ad valorem	11
59	Carriages and carts, including jinrikshas, bath chairs, perambulators, trucks, wheelbarrows and all other sorts of conveyances and component parts thereof not otherwise specified, including motor vans if imported with all their parts assembled, and also including motor lorries and the following component parts of motor lorries, namely:—Chassis, solid tires, wheels, bodies, axles and gear boxes (see No. 60).....	Ad valorem	11
60	Motor-cars, motor-cycles, motor-scooters, bicycles, and tricycles and parts and accessories thereof; provided that such parts or accessories as are ordinarily also used for other purposes shall be dutiable at the rate of duty specified for such articles.....	Ad valorem	20
	Belting of all materials for driving machinery...	Ad valorem	2½

Federated Malay States

Duties levied on rubber exported from the Federated Malay States have been revised, the changes becoming effective November 24, 1921. Detailed items are as follows:

Rubber—	Export Duty
Any cultivated rubber (including latex):	One and one-half per cent of the value of the rubber calculated at the price notified for the time being in the <i>Gazette</i> .
When the price of rubber as notified for the time being in the <i>Gazette</i> is 35 cents per pound or over, but is under 37 cents per pound.	An increase in the duty of ¼ per cent of the value as above ascertained.
And for every increase of 1 cent or under in the price per pound up to 40 cents per pound.	Two and one-half per cent of the value of the rubber calculated at the price notified for the time being in the <i>Gazette</i> .
When the price of rubber as notified for the time being in the <i>Gazette</i> is 40 cents per pound or over, but is under 1.50 dol. per pound.	Three per cent of the value of the rubber calculated at the price notified for the time being in the <i>Gazette</i> .
When the price of rubber as notified is 1.50 dol. per pound or over.	

Note: For the purposes of this notification one gallon of latex shall be taken as equivalent to one pound of rubber, and bark shavings from rubber trees shall be taken to contain 20 per cent by weight of rubber.

Nigeria

According to a ruling, effective November 10, 1921, a license granted by the Comptroller of Customs is necessary in order to import the following goods into Nigeria: (a) solid tires for motor vehicles; (b) double tires whether solid or pneumatic for motor vehicles; (c) motor vehicle wheels adapted for solid or double tires; d) motor vehicles fitted with wheels adapted for solid or double tires.

Union of South Africa

A proclamation, effective November 4, 1921, and concerned chiefly with importations of rubber, or materials used in its manufacture, states that, upon declaration by a manufacturer that certain materials imported by him are to be used solely in the manufacture of specified goods, the duties levied upon such materials will be refunded or a rebate granted.

Specifications are as follows:

Rebate of 5 per cent of the duty on rubber-proofed material imported in the piece and made of cotton, hair, silk, or wool, or mixtures thereof, imported or taken out of bond, by manufacturers of waterproof clothing for the purpose of making such clothing.

Rebate of the full duty shall be allowed on compounding ingredients used in the manufacture of rubber on importation by, or when taken out of bond by, manufacturers of rubber.

English Import and Export Lists for 1922 Revised

Various alterations have been made by England's Joint Board of Trade and Customs Revising Committee in connection with that country's import and export list for 1922. One of the new sub-divisions added states that importers and exporters in future will be required to distinguish, in the case of solid rubber tires, between those intended (a) for mechanically propelled vehicles; and (b) for other vehicles.

The Rubber Trade in the Far East

By Our Regular Correspondent

Malaya

The question of stocks and prices is occupying many minds. Now that prices have been improving, many ask, what of stock? The *Straits Times* in an endeavor to answer this question gives as its opinion that while stocks in consumers' hands have run low, necessitating purchases to cover needs, it should not be inferred that there is a substantial increase in consumption. Owing to stringency of credit, consumers are prevented from benefiting to the full by the low prices prevailing, but speculative buying has been rather prevalent, which is keeping prices up to their present level.

Meanwhile the revival in the rubber industry, however it may be regarded, has resulted in a decided brightening of business in these parts, which will tend to increase with the visit of the Prince of Wales. The share market, too, has been livelier than has been the case for many a day, and altogether money seems to be moving more freely and prospects appear to be brighter all around.

Forward Sales

The condemnation of forward sales by the Rubber Growers' Association has caused more or less heated discussion. Some hold that in many cases forward sales have helped estates lacking funds to carry on. Again, many companies owed their comparatively strong positions in the slump to wisely made forward contracts.

Others claim that selling forward at present is bad business for the producer, as only the manufacturer is benefited; that the industry is imperiled because so long as consumers can obtain rubber at the present low prices by means of forward contracts values will remain low. Although the prices obtained show a certain margin of profit, the present costs of production are really fictitious, having been arrived at in most cases by unsound economics, such as laying off coolies. When prices make production profitable once more, a shortage of labor would result in high wages that would more than counterbalance the profit made owing to previous low costs.

The Rubber Census

Further details regarding the rubber census state that it will fall into two main divisions, a census of stocks and one of acreage under rubber. It is hoped to obtain under the latter head the acreage of: (1) Rubber that has been tapped; (2) Rubber not yet tapped but over 4 years old; (3) Rubber not tapped, over 3 years old; (4) Rubber not tapped, over 2 years old; (5) Rubber not tapped, over 1 year old; (6) Rubber under one year old.

Malaya's Soil

Herbert Ashplant, South India, has written an interesting article on Malaya's soil apropos of the remarks of the Director of Agriculture of Malaya that local rubber soils are deteriorating. Mr. Ashplant is of the opinion that this is true inasmuch as the practice of clean-weeding on many estates assists the washing away of the rich top-soil by the heavy tropical rains. This is particularly true of estates in hilly districts, and more than half the rubber here is planted on slopes. Furthermore, he claims that planters in Malaya have made little progress with measures for counteracting soil wash. Malaya, with her lack of a sufficient and cheap labor supply, cannot afford to have the fertile surface

soil, which is responsible for the high yields of rubber trees here, washed into the rivers.

Company Notes

In looking through recent company reports it was interesting to note that the Bagan River Rubber Co., Limited, has instructed its manager to do all further supplying by budding from high yielding stock as is being done in the Netherlands East Indies. Already steps have been taken to train the necessary coolies in this work, and it is hoped results will help to counterbalance the limited acreage to which the program of upkeep is confined.

Rubber is being destroyed to make place for coconuts on the rubber fields of the Straits Plantations, Limited. In November tapping was discontinued owing to the fact that rubber did not pay, and now trees are being destroyed to benefit coconuts.

The Batak Rabit Rubber Estate, Limited, reports a profit of £3,208 for the year. After payment of a 5 per cent dividend, which will absorb £3,750, the sum of £7,049 remains to be carried forward. The company further has a claim for refund of excess profits duty amounting to £3,947. The crop is being restricted, and by adopting alternate daily tapping, as so many other estates here are doing, it is hoped to produce a smaller crop at a lower cost. Forward sales against the crop of the current year are 73,920 pounds at 2s. 2.34d. per pound.

Ceylon

Much satisfaction has been expressed in rubber circles by the refusal of the Secretary of State to sanction the recommendations of the Special Committee of the Legislative Council in regard to the sliding scale of rubber export duty. A flat rate of export duty is considered more satisfactory, as it enables rubber traders to work out duty calculations more easily. Under the provisions of the proposed sliding scale of duty rubber, which is now around 65 cents a pound, would have had to pay a tax of 5 cents per pound as against the flat rate of 3 cents a pound.

Rubber Restriction Again

The latest restriction scheme of the Rubber Growers' Association has failed. As has been said before, the majority of Ceylon planters are against restriction, and it seems to be quite evident that nothing will induce Ceylon to take up a restriction scheme, especially now that prices have been improving. Indeed as the *Times of Ceylon* says:

"At the present level of prices it is a very poor, badly managed or unfavorably situated estate in Ceylon that cannot sell its rubber at a figure which leaves a very respectable margin over the cost of production. Why then, it is asked, should Ceylon estates not get all the rubber they can get from their trees?"

Is a Rubber Boom in Sight?

A Major J. C. G. Kunhardt, of the Indian Medical Service, has caused quite a flutter here by his booklet on the rubber position and more recently by his personally expressed views on the subject. For about twelve years he has been interested in the potentialities of the rubber industry and has studied statistical data on the subject. After a careful and systematic review of all data available, he arrived at the conclusion that during 1922 there would be a serious shortage of rubber. He says that in all estimates of stocks of rubber hitherto published no allowance was made for depletion of manufactured stocks held by dealers and manufacturers, nor of the surplus war stocks. In his opinion, these stocks of manufactured rubber have been enormously depleted. Invisible stocks of raw and manufactured rubber have been purposely kept low and have been reduced by at least 25 per cent below normal. American tire factories alone have reduced tire stocks normally held by 50 per cent. Figuring that recent activities in the American rubber factories have reduced the surplus stocks so that they are now not greater than normal, and that there is a surplus of 40,000 tons in England and possibly

5,000 tons in Japan, he holds that the total surplus stocks do not amount to more than 45,000 tons. But this quantity is more than counterbalanced by the deficiency in invisible raw and manufactured stocks, which he figures amount to about 60,000 tons. Consequently there is a real deficiency of 15,000 tons at the beginning of 1922.

Exports to Germany

During the period January 1 to December 20, 1921, Ceylon shipped to Germany 374,281 pounds of rubber, against 113,234 the year before.

Rubber Research in Ceylon

The importance of a well-equipped scientific department for agriculture in general and rubber in particular seems to have been fully grasped by the local government. With regard to rubber, a new rubber research scheme, according to which the Government contributes 60 per cent of the working costs and the producers the remainder, has come into being. The Rubber Growers' Association placed £2,000 at the disposal of the research organizers and will give further support if the scheme works well. Last year the Government gave 45,000 rupees. It was agreed to extend the scheme by asking the support of proprietary planters in Ceylon, which has been promised and an offer of representation on the executive committee of the research scheme has been accepted.

Rubber Goods from Latex

The Pantiya Estate in the Kalutara District is reported to be making progress in the manufacture of rubber goods from latex direct. In a new method one layer is cemented over another layer of rubber stitched in the ordinary way to the tops of canvas shoes. This prevents the thread from wearing away through contact with the ground and causing top and sole to separate. The cement is locally made and is said to be damp and oil-proof and to stand heat and strain exceedingly well.

The discovery of this new cement has led to experiments in re-treading automobile tires, and it is expected that re-treading will eventually be a success. The Galaha Estate Company, the Colombo agent of the Pantiya Estate, has recently placed a first order from London for 300 carpets and a full range of samples of other articles manufactured.

MEXICO TO HOLD 1922 AUTOMOBILE SHOW

Notice has been received concerning the coming automobile show, to be held in the National Theatre, Mexico City, Mexico, April 16-23, inclusive. The automotive division of the committee on arrangements for this show includes the names of a number of well-known officials, representing firms of this country and South America. Rubber interests and men mentioned in connection with the event include the following: J. H. Blakeney, Avenue Juarez, No. 84 (The Goodyear Tire & Rubber Co.); S. Lee Carrico, Calle Humboldt, No. 44 (United States Rubber Export Co.); J. D. Maxwell and R. E. Griffith, Apartado 121-Bis (The Miller Rubber Co.); William H. Stanley, Capuchinas, No. 25 (Brunswick-Balke-Collender Co.); and A. C. Walker, Calle Roma, No. 41 (The Fisk Rubber Co.)

FINLAND UNDERTAKES CABLE MANUFACTURE

Press reports state that the workshops of the Finska Kabel-fabriken A. B., a company formed in the autumn of 1916, are now in operation at Helsingfors for the manufacture of cables. All kinds of vulcanized conductors will be produced, as well as large cables for power purposes. A complete rubber department has been established for the production of insulating material direct from raw rubber, and the wire-drawing plant has an output capacity of 1,000 tons per annum.

Recent Patents Relating to Rubber

The United States

Granted January 3, 1922

- N**O. 1,401,948 Resilient tire reinforced with metal inner tube. J. M. Abrams, Brooklyn, N. Y.
- 1,401,958 Non-collapsible nipple. D. B. Broadwater, Millville, assignor of 1/20 to W. K. Pierce, Bridgeton—both in N. J.
- 1,402,003 Demountable rim for pneumatic tire. P. M. Miller, Brooklyn, N. Y.
- 1,402,141 Demountable rim for tire. T. M. Brintnall, assignor of $\frac{3}{4}$ to J. F. Hanly, $\frac{1}{4}$ to C. H. Hanly, and $\frac{1}{4}$ to R. E. Hanly—all of Oakland, Calif.
- 1,402,142 Demountable rim for tire. T. M. Brintnall, assignor of $\frac{3}{4}$ to J. F. Hanly, $\frac{1}{4}$ to C. H. Hanly, and $\frac{1}{4}$ to R. E. Hanly—all of Oakland, Calif.
- 1,402,164 Multiple fountain pen. L. L. Houser, Mishawaka, Ind.
- 1,402,179 Exercising apparatus to be worn. E. J. Piscitelli, Philadelphia, Pa.
- 1,402,190 Cushion tire. B. C. Swinehart, Akron, O.
- 1,402,191 Rubber-tired caster. A. Thiele, Dayton, O.
- 1,402,212 Resilient tire filler. W. Collins, Fort Worth, Tex.
- 1,402,244 Clothes wringer. W. H. Meyer, St. Louis, Mo., assignor by mesne assignments to The Davis Sewing Machine Co., a Delaware corporation.
- 1,402,359 Resilient tire having two pneumatic tires between rim and tread. H. A. Hille, Oskaloosa, Ia.
- 1,402,377 Rubber heel. G. F. Quinn, Beaumont, assignor to Simplex Rubber Co., Boston—both in Mass.
- 1,402,404 Lady's undergarment with elastic waistband. A. Emerson, New York, N. Y.
- 1,402,406 Union suit with elastic insert above waistline at back. C. S. Erlanger, Elberon, N. J., assignor to The B. V. D. Co., New York, N. Y.
- 1,402,409 Fountain pen. M. Finstone, Brooklyn, N. Y.
- 1,402,443 Disk wheel with dual solid tires. A. L. Putnam, Detroit, Mich., assignor by mesne assignments to Detroit Pressed Steel Co., a Delaware corporation.
- 1,402,550 Hat protector. Wui Kong Un, Hongkong, Kwang Tung, China.
- 1,402,556 Demountable rim for tire. G. E. Whiteside, East Point, Ga.
- 1,402,588 Infant's pants laced at sides to allow for child's growth. R. Falter, Brooklyn, N. Y.
- 1,402,624 Non-inflatable resilient tire. C. H. Lambert, assignor to Hercules Rubber Corporation—both of Cincinnati, O.
- 1,402,628 Rubber tire reinforced by wooden blocks embedded in tire when molded. J. D. McGrath and C. H. McCarthy, New York, N. Y.
- 1,402,657 Windshield cleaner. O. C. Ritz-Woller, Chicago, Ill.

Reissues

- 15,260 Magazine pencil. L. J. Most, New York, N. Y., assignor by mesne assignments to Pencil Products Corporation, a Virginia corporation. Original No. 1,325,570, dated December 23, 1919.

Granted January 10, 1922

- 1,402,729 Tire pressure gage. W. A. Allen, Yonkers, N. Y., and C. C. Abbe, Essex Fells, N. J., assignors by direct and mesne assignments to A. Schrader's Son, Inc., New York, N. Y.
- 1,402,808 Tire boot. O. C. Thomey, Osseo, Wis.
- 1,402,947 Cushion tire. D. S. Myers, Lakemore, O., assignor by mesne assignments to S. Johnstone, Buffalo, N. Y.
- 1,402,963 Wheel tread. M. W. Reed, Marion, Ind.
- 1,403,000 Blowout boot for tires. W. N. Auchair, Echo, Ore.
- 1,403,006 Pressure-controlling device for pneumatic tires. J. C. Brakeman, Toronto, Ont., Can.
- 1,403,056 Valve and nozzle. W. Noble, Providence, assignor to Tubular Woven Fabric Co., Pawtucket—both in R. I.
- 1,403,058 Tire-repair material. H. B. Pushee, assignor to The General Tire & Rubber Co.—both of Akron, O.
- 1,403,115 Combination tire and wheel. M. Golein, Brooklyn, N. Y.
- 1,403,141 Means for attaching tires to demountable rims. L. P. Worrall, Indianapolis, Ind.
- 1,403,242 Bicycle pedal rubber. R. S. Heise, assignor to The Miami Cycle & Manufacturing Co.—both of Middletown, O.
- 1,403,289 Cushion tire. L. Cartier, Oakland, Calif.
- 1,403,423 Stopper for laundry trays and similar devices. N. B. Le Duc, Pasadena, Calif.
- 1,403,436 Nut-draining machine. A. N. Massey, San Francisco, Calif.
- 1,403,452 Non-skid sectional tire tread. G. L. Simpson, Santa Ana, Calif.
- 1,403,468 Demountable rim for tires. B. W. France, Brooklyn, N. Y.

Granted January 17, 1922

- 1,403,484 Tire inflation valve. D. G. Clifford, Chicago, Ill.
- 1,403,455 Windshield cleaner. C. Eibye, assignor to The H & E Co.—both of Boston, Mass.
- 1,403,691 Tire patch. H. W. Jordan, assignor to A. J. Stephens Rubber Co., Inc.—both of Kansas City, Mo.
- 1,403,703 Windshield wiper. F. Mertz, assignor of $\frac{1}{2}$ to C. S. Mishler—both of Johnstown, Pa.
- 1,403,710 Windshield wiper. B. Rockman, Boston, Mass.
- 1,403,821 Band to attach around rim under tire to prevent corrosion of tire. L. H. Swain, Manchester, Eng.
- 1,404,012 Combined fountain pen and pencil holder. Attilio Conte, Buenos Aires, Argentina.

- 1,404,045 Rubber heel. F. Neger, Chicago, Ill.
- 1,404,059 Resilient tire. W. Reid, R. H. Reid, and W. Reid, Jr., all of Hamilton, Scotland.
- 1,404,111 Resilient tire. A. E. Gladu, Lynn, Mass.
- 1,404,119 Billiard-table cushion. W. L. Harris, Warsaw, Ill.

Granted January 24, 1922

- 1,404,181 Garment supporter. B. S. Alsop, New York, N. Y.
- 1,404,300 Invalid's sanitary comfort lift with rubber-cushioned legs. N. F. Hurst, Eureka Springs, Ark.
- 1,404,345 Ink. B. Dales, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
- 1,404,355 Printing ink. W. W. Evans and B. Dales, Akron, O., assignors to The B. F. Goodrich Co., New York, N. Y.
- 1,404,391 Resilient tire. M. Harlice, Winchester, Va.
- 1,404,459 Cushion tire. O. A. Lane, Los Angeles, Calif., assignor to National Airless Tire Co., Reno, Nev.
- 1,404,489 Knee garment with elastic sock supporter. H. L. Snow, Columbus, O.
- 1,404,532 Double pneumatic tire. P. T. Lehr, New York, N. Y.
- 1,404,616 Cap with elastic insert in band. L. Kronthal, New York, N. Y.
- 1,404,685 Pneumatic tire with armor strip of perforated soft rubber between inner tube and casing. G. E. Caylor, Delaware, O.
- 1,404,722 Fabric and rubber knee protector. J. S. Swope, assignor of 45 per cent to J. A. Scarborough and 20 per cent to R. W. Wortham—all of Paris, Tex.
- 1,404,723 Same as 1,404,722.

Granted January 31, 1922

- 1,404,754 Demountable rim for dual pneumatic tires. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
- 1,404,789 Syringe. C. E. Morris, Brooklyn, N. Y.
- 1,404,864 Demountable rim for tires. G. M. Kline, Harrisburg, Pa.
- 1,404,876 Cushion connection for vehicle construction. A. F. Masury and A. H. Leipert, assignors to International Motor Co.—all of New York, N. Y.
- 1,404,894 Sounding toy. G. L. Rollins, Kansas City, Mo., assignor of $\frac{3}{4}$ to J. W. Reed, Chicago, Ill.
- 1,405,158 Conveyor belt. Ludvig T. Petersen, Youngstown, O.
- 1,405,199 Garter or suspender. C. V. Fulton, Hyde Park, South Australia, Australia.
- 1,405,279 Toothbrush. W. M. Cassidy, Cape May, N. J.

The Dominion of Canada

Granted January 3, 1922

- 214,915 Teat cup for milking machine. S. M. Bower, Bellevue Hill, Sydney, New South Wales, Australia.
- 214,923 Blowout patch for pneumatic tires. W. Eason, Nokomia, Sask.
- 214,942 Collapsible bath and dressing table. W. J. Jackson, Detroit, Mich., U. S. A.
- 214,955 Sole. W. Palombo, Montreal, Que.
- 214,965 Inner tube. M. E. Simes, Benigo, Victoria, Australia.
- 214,979 Inner tube having layer of cord fabric incorporated in it, the cords running around the tube with ends overlapping to form reinforcement at inner side. The Dunlop Tire & Rubber Goods Co., Limited, assignee of T. A. Burns—both of Toronto, Ont.
- 214,992 Corset pad with elastic attaching strips. L. Starkey and O. P. Decker, assignee of $\frac{1}{2}$ interest—both of Enid, Okla., U. S. A.

Granted January 17, 1922

- 215,117 Tire valve. C. A. Champlin, Hope, Arkansas, U. S. A.
- 215,135 Pad for soles. S. A. Gizzi, Niagara Falls, Ont.
- 215,164 Tire valve. B. Pangrazio, LeRoy, New York, U. S. A.
- 215,249 Elastic fabric. The Treco Co., Inc., assignee of M. W. Schloss—both of New York City, U. S. A.

Granted January 24, 1922

- 215,252 Collapsible rim for tires. G. E. W. J., and J. W. McCallum, co-inventors, all of Kingston, Ont.
- 215,302 Tire valve cap. H. P. Kraft, Ridgewood, New Jersey, U. S. A.
- 215,304 Dust cap for tire valves. H. P. Kraft, Ridgewood, New Jersey, U. S. A.
- 215,305 Cord tire. F. L. Kryder, Akron, Ohio, U. S. A.
- 215,359 Self-filling fountain pen. The Dunning-Pen Co., Inc., New York City, assignee of M. B. Dunn, executrix of estate of C. Dunn, deceased, both of Brooklyn—both in New York, U. S. A.
- 215,450 Game board with cushioned sides. W. E. Olson, Stevens Point, Wis.

Granted January 31, 1922

- 215,411 Demountable rim for tires. J. A. Beddingfield, Fort Valley, Georgia, U. S. A.
- 215,447 Garter. W. A. Mathieson, Timaru, N. Z.
- 215,505 Golf ball. The B. F. Goodrich Co., New York, N. Y., assignee of J. R. Gammeter, Akron, Ohio—both in U. S. A.
- 215,520 Tire valve. The Payne Valve Corporation, assignee of M. J. Payne—both of Staunton, Va., U. S. A.
- 215,527 Washer for tire valves. A. Schrader's Son, Inc., New York, N. Y., assignee of H. P. Kraft, Ridgewood, N. J.—both in U. S. A.

The United Kingdom

Published December 31, 1921

- 171,383 Dust cap for tire valves. A. Schrader's Son, Inc., 470 Vanderbilt avenue, Brooklyn, assignee of M. C. Schweinert, 42 Riverside Drive, Manhattan—both in New York, U. S. A. (Not yet accepted.)
- 171,460 Device of celluloid and elastic strips for retaining hat on wearer's head. J. H. Morley, 46 Dumont Road, Stoke Newington, H. H. Gilbert, 34 Finsbury Square, and C. D. Goldston, 20 Whitecross Place, Eldon street, Finsbury—all in London.
- 171,528 Golf ball. J. White, Golf Club, Sunningdale, Berkshire.
- 171,588 Hose connection. E. Heads, 91 Albany Road, Victoria Park, near Perth, Western Australia.

Published January 11, 1922

- 171,627 Tire-valve closure. W. C. Mead, 124 King Street West, Toronto, Ont.
- 171,657 Resilient sole. T. Herbert, 153 Howard street, Glasgow.
- 171,658 Tobacco-pipe case of rubber with fireproof disk to cover bowl. E. Rohlin, 63, Al. Föreningsgatan, Malmö, Sweden.
- 171,707 Football closure. K. Buchner and F. Stocklein, 6 Niederweirnerstrasse, Schweinfurt, Germany. (Not yet accepted.)
- 171,802 Rubber protectors for soles and heels. C. H. Robinson, 51 Leybourne Road, Leytonstone, London.
- 171,807 Device for attaching tires to rims. J. Donkin, 3 Pembroke Cottages, Kensington, London.

Published January 18, 1922

- 171,871 Heelless galoshes with elastic side inserts. B. M. J. de Candolle, 6F Hyde Park Mansions, Marylebone Road, London.
- 171,936 Golf ball with air passages. J. B. Hayward, 52 George street, Manchester, and T. Swanston, 102 Claremont Road, Irlams o'-the-Height, Salford.
- 172,047 Pneumatic cushion wheel. C. Green, Hardman Fold, Green Lane, Bolton.

Published January 25, 1922

- 172,097 Tire core composed of several rubber elements, which may be made on the device described in Specification No. 172,096. D. Maggiora, Castello delle Trespiano, Florence, Italy.
- 172,154 J. W., C. W., C. J., and M. E. Bryant and W. Shell, Welsford street, Shepparton, Victoria, Australia.
- 172,256 Suspenders, garters, etc. F. Barth, 125A Märkischerstrasse, Barmen, Germany.
- 172,363 Demountable rim for tires. The Goodyear Tire & Rubber Co. and F. A. Seiberling, 1144 Market street, Akron, Ohio, U. S. A.
- 172,388 Apparatus employing toy balloons, for playing a game at fairs, etc. F. R. Chester, 1109 Wananaga Drive, Asbury Park, New Jersey, U. S. A.

New Zealand

Published December 15, 1921

- 44,207 Resilient tire. F. Ditchfield, 3 St. Nicholas street, Montreal, Que., Can.
- 46,483 Benzine, etc., tin emptying device with rubber washer. W. M. Moore, Palmerston North, N. Z.
- 46,534 Teat-cup inflation. J. Treloar, Hamilton, N. Z.
- 46,684 Resilient core for tire. G. A. H. Robbins, "Delamore," Kedron, and S. F. E. Einsiedel, 82 Arthur street, New Farm—both in Brisbane, Queensland.

Germany

Patents Issued, with Dates of Issue

- 348,622 (November 11, 1920) Atomizer. Dr. Albrecht Meyenberg, Potsdamerstrasse 27 b., Berlin.
- 348,639 (February 8, 1920) Elastic tire. Johann August Prince, Chaville, France, and Albert Ludwig Gilles, Paris. Represented by Dr. Breitenbach, Düsseldorf.
- 348,971 (December 3, 1920) Hypodermic syringe. Samuel James Everett and Arthur Kirkman, Thornton Heath, Surrey, England, represented by Dr. Döllner, Seiler and Maemcke.
- 349,110 (December 25, 1919) Injection canule for medicinal syringes. Franz Masarey, Ziegelstrasse 26, Berlin.
- 349,111 (December 19, 1920) Clyster syringe. Wilhelm Grunwald, Augustastrasse 186, Mulheim, Ruhr-Styrum.
- 349,284 (July 28, 1920) Syringe, particularly for medical purposes. Robert Helwig, Andreasstrasse 22, Berlin.

TRADE MARKS

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted January 3, 1922, Act of February 20, 1905

- 150,243 COUNTERPOISE—boots and shoes made of rubber, leather, fabric, or a combination of them. James A. Banister Co., Newark, N. J.
- 150,291 CHEW-T—combination of chicle and essence of tobacco. Chew't Co., Cincinnati, O.

- 150,357 FEDERAL—hoof pads. Federal Rubber Co., Cudahy, Wis.
- 150,358 FEDERAL—hoof pads. Federal Rubber Co., Cudahy, Wis.
- 150,359 FEDERAL—hoof pads. Federal Rubber Co., Cudahy, Wis.
- 150,377 GOODWORTH—rubber, leather, and canvas conveyor belting. Gifford-Wood Co., Hudson, N. Y.
- 150,378 DURALIFE—rubber, leather, and canvas conveyor belting. Gifford-Wood Co., Hudson, N. Y.
- 150,384 Conventional label outline in shape of broken circle with extension round-ended tabs at sides—rubber belting. The Goodyear Tire & Rubber Co., Akron, O.
- 150,395 PAUPO—waterproof dressing for leather, rubber, and fabrics in general. Hail Products Co., Portland, Ore.
- 150,448 Conventional representation of a connected bar and triangle, the triangle having a smaller triangle within it—pneumatic tires. Lee Tire & Rubber Co., Whitemarsh Township, Montgomery County, Pa.
- 150,649 WILSON BROS.—garters, suspenders, belts, and armbands. Wilson Brothers, Chicago, Ill.
- 150,651 SIGNATURE—garters, belts, suspenders, and armbands. Wilson Brothers, Chicago, Ill.

Act of March 19, 1920, Section 1 (b)

- 150,663 KANTLEAK—tire valves. George A. Ambler, Winchester, Mass.

Granted January 10, 1922, Act of February 20, 1905

- 150,720 ALL STAR—toy balloons. Richard D. Bakrow & Son, Louisville, Ky.
- 150,811 FEDERAL—rubber heels and soles. Federal Rubber Co., Cudahy, Wis.
- 150,812 FEDERAL—rubber heels and soles. Federal Rubber Co., Cudahy, Wis.
- 150,813 FEDERAL—rubber heels and soles. Federal Rubber Co., Cudahy, Wis.
- 150,826 SILVERTOWN—cord or thread and rubber pneumatic tire casings. The B. F. Goodrich Co., New York, N. Y.
- 150,990 PYRAMID BRAND and representation of two pyramids within an oval—boots, shoes, and slippers made of fabric and rubber.
- 150,992 UNIVERSAL—hose clamps. Universal Industrial Corporation, Hackensack, N. J.

Granted January 24, 1922, Act of February 20, 1905

- 150,075 ALL STAR ASSORTMENT RUBBER TOY BALLOONS superimposed above orange-colored star on green background—toy balloons. Richard D. Bakrow & Son, Louisville, Ky.
- 151,082 PURITAN—waterproof house aprons and infants' rubber pants. I. J. Beyerle Manufacturing Co., New York, N. Y.
- 151,090 B & Co. as monogram above INC SERVICE, all within a triangle—rubber heels. Brooks & Co., Inc., Boston, Mass.
- 151,105 Representation of a bulldog with the Capitol Building in the background—toy animals, toy balloons, and barking or sounding toys. H. R. Colwell, Washington, D. C.
- 151,120 DONLEY NO PIN arranged in form of T so that N in Donley of the crosspiece serves as N in No at top of stem—garters. The Donley No-Pin Garter Co., Chicago, Ill.
- 151,127 DAISY—hoof pads. Federal Rubber Co., Cudahy, Wis.
- 151,128 GLADIATOR—hoof pads. Federal Rubber Co., Cudahy, Wis.
- 151,131 RUBBARDUB—inflatable toys of rubber, representing animals, human beings and other objects. J. G. Franklin & Sons, Limited, Dalston, London, England.
- 151,174 S. S. S.—fountain pens. Hosonuma & Co., Limited, Nihonbashi, Tokio, Japan.
- 151,180 JIFFY—windshield cleaners. The LaVie's Manufacturing Co., New Haven, Conn.

Act of March 19, 1920, Section 1 (b)

- 151,295 DALY within a rectangle superimposed above the word SIMPLEX—tire rims and rim attachments. The Daly Manufacturing Co., Inc., Los Angeles, Calif.
- 151,307 SURE STEP—rubber mats for automobiles. Sure-Step Auto Mat Co., Boston, Mass.

Granted January 31, 1922, Act of February 20, 1905

- 151,317 RAYON—tire-sealing compound. C. L. Brown, Oklahoma, Okla.
- 151,323 Representation of grotesque figure with head caricaturing a golf ball—golf balls. The Dunlop Rubber Co., Limited, Aston, Cross, Birmingham, Eng.
- 151,324 Representation of grotesque figure with head caricaturing a golf ball—golf balls. The Dunlop Rubber Co., Limited, Aston Cross, Birmingham, Eng.
- 151,325 Representation of grotesque figure with head caricaturing a golf ball—golf balls. The Dunlop Rubber Co., Limited, Aston Cross, Birmingham, Eng.
- 151,364 OSAMA—air-hose reel. O. Stroberger, Creighton, Neb.

Act of March 19, 1920, Section 1 (b)

- 151,387 GRIP-TITE—transmission belts and belting made of rubber combined with fabric. The B. F. Goodrich Co., New York, N. Y.
- 151,405 SCLEROSCOPE—scales for use in instruments for testing the hardness of solid bodies. The Shore Instrument & Manufacturing Co., Jamaica, N. Y.
- 151,406 SCLEROSCOPE—instrument for testing the hardness of solid bodies. The Shore Instrument & Manufacturing Co., Jamaica, N. Y.

The Dominion of Canada

Registered

- 30,110 LISTERATED—chewing gum. Listerated Gum Corporation, New York, N. Y.
- 30,120 BLUENOSE PRES-CURE—rubber footwear. The Kaufman Rubber Co., Limited, Kitchener, Ont.
- 30,132 MI BABY DAINTI—infants' sanitary specialties. Climax Specialty Co., St. Louis, Mo.

- 30,133 CLIMAX—ladies' and infants' sanitary specialties. Climax Specialty Co., St. Louis, Mo.
 30,134 MR DAINTI—ladies' sanitary specialties. Climax Specialty Co., St. Louis, Mo.
 30,135 CLIMAX—sanitary dress goods, notions, etc. Climax Specialty Co., St. Louis, Mo.
 30,192 HICKORY—elastic webbing, sanitary specialties, household aprons, rubber sheeting, etc. A. Stein & Co., Chicago.
 30,204 ADAMS BLACK JACK, A CHICLE A and CHEWING GUM on an elliptically shaped panel—chewing gum. Canadian Chewing Gum Co., Limited, Toronto, Ont.
 30,205 ADAMS CALIFORNIA FRUIT, A CHICLE A, and CHEWING GUM, with representation of various fruits—chewing gum. Canadian Chewing Gum Co., Limited, Toronto, Ont.
 30,208 BEST IN THE LONG RUN—tires, tire repair material, inner tubes, pure gum sheets, self-vulcanizing patches, cement, motorcycle grips, etc. The B. F. Goodrich Co., New York City, U. S. A.
 30,224 SUPER SERVICE with diamond-shaped figures at ends of words enclosing letter R—insulated electric cables. Rome Wire Co., Rome, New York, U. S. A.

The United Kingdom

Published January 4, 1922

- 419,340 CALLENDER CABLE on bottom of three steps, below nude figure uncoiling cable from roll and coiling it around a globe—electric cables. Callenders Cable & Construction Co., Limited, Hamilton House, Victoria Embankment, London, E.C.4.
 419,666 "JOCK" beneath representation of a dog wearing a tam o'shanter over one ear—fountain pens. William Ritchie & Sons, Limited, 24 Elder street, Edinburgh, Scotland.

Published January 11, 1922

- 410,810 Representation of a label bearing the words AIR-TITE Auto Parts, a facsimile signature, and other lettering—rubber patching material. W. B. Wilkins, trading as The Air-Tite Manufacturing Co., Endsleigh, 61 Finsbury Park Road, London, N.4.
 418,920 RADIC—electrically-heated vulcanizing apparatus. Harvey Frost & Co., Limited, 148-150 Great Portland street, London, W.1.
 419,447 Representation of a bee within a circle and having the words BEE and TUM, respectively, on its wings—machine belting. F. Reddaway & Co., Limited, Victoria Mills, Cheltenham street, Pendleton, Manchester, Lancashire.
 420,310 ST. PETER—tennis balls, cricket balls, etc. The Sports Co., 63 Cannon street, Manchester, Lancashire.
 420,396 LOCO—rubber crutch-shoes. F. C. Lynde, trading as The Loco Pneumatic Non-Slip Crutch Shoe Co., 51 King street, Manchester.

Published January 18, 1922

- 417,294 Representation of an Indian's head within a circle—rubber heels, pads, and soles. Padmore & Barnes, Limited, Moccasin Works, St. James Road and Sharman street, Northampton, Northamptonshire.
 420,317 Representation of a tire in perspective as a frame for picture of Napoleon—tires. The N. A. P. Pneumatic Tube Tyre Syndicate, Limited, Stonhouse street, Clapham, London, S.W.4.

Published January 25, 1922

- 415,855 A within outline of a spade-spot—combs, buttons, cigarette and cigar holders, tobacco-pipe mouthpieces and stems, all made of material covered by Class No. 50. American Hard Rubber Co., 11 Mercer street, New York, N. Y.; address for service in United Kingdom, care of Haseltine, Lake & Co., 28 Southampton Buildings, London, W.C.2.
 419,634 CARRELAX—blacks of all kinds in powder form, being pigments. The British & Foreign Metal & Chemical Co., Limited, Milburn House, Dean street, Newcastle-upon-Tyne, Northumberland.
 420,371 NIELEMO—fountain pens. Hemmings & Nielsen, Kingsway House, Kingsway, London, W.C.2.
 420,899 THE QUEST—combs and brushes of all kinds included in Class No. 50. A. W. Kanis, 66 Aldersgate street, London, E.C.1.

New Zealand

Published December 15, 1921

- 14,935 Representation of a dog standing on corner of a diamond bearing letters D & M—game balls, exercisers, and other sporting goods. The Draper-Maynard Co., Plymouth, New Hampshire, U. S. A.
 15,931 Representation of an airplane—dyes in Class No. 4. National Aniline & Chemical Co., Inc., 21 Burling Slip, New York City, U. S. A.
 16,240 Representation of an opened-out label bearing the words YUCATAN CHEWING GUM on three faces—chewing gum, etc. American Chicle Co., 19 West 44th street, New York City, U. S. A.

Designs

The United States

Patented November 29, 1921

- 59,807* Rubber heel. Term 14 years. Pasquale Altruda, Providence, R. I.

*Omitted from THE INDIA RUBBER WORLD, January 1, 1922.

Patented January 3, 1922

- 60,144 Clothes wringer. Term 14 years. A. O. Hubbard, Minneapolis, Minn.
 60,159 Combination hose coupling and valve. Term 14 years. H. Y. Norwood, assignor to Taylor Instrument Cos., both of Rochester, N. Y.

Patented January 10, 1922

- 60,188 Garment protector. Term 14 years. G. K. Quinzburg, assignor to I. B. Kleinert Rubber Co., both of New York, N. Y.

Patented January 17, 1922

- 60,219 Rubber heel. Term 14 years. F. G. Delbon, Brooklyn, N. Y.
 60,229 Rubber sole. Term 7 years. D. Freeman, Roxbury, assignor to Panther Rubber Manufacturing Co., Stoughton—both in Mass.
 60,230 Rubber heel. Term 7 years. D. Freeman, Roxbury, assignor to Panther Rubber Manufacturing Co., Stoughton—both in Mass.
 60,276 Tire. Term 14 years. L. S. Utter, Los Angeles, Calif.
 60,283 Fountain pen. W. S. Gerts, River Forest, Ill.



60,276

The Dominion of Canada

- 5,299 Dust cap for tire valves. Patented December 27, 1921. R. S. Smart, Ottawa, Ont.

Germany

Design Patents Issued, with Dates of Issue

- 801,890 (November 28, 1921) Nipple with container. Josef Weber, Ogersheimersstrasse 57, Ludwigshafen-on-the-Rhine.
 802,061 (November 28, 1921) Pneumatic tire. Bernhard Noack, Liberdastrasse 12, Neukölln.
 802,221 (October 17, 1921) All rubber tobacco pouch. R. Hofmann, Framersheim, Kr. Alitzey, Rheinhessen.
 802,297 (November 19, 1921) Injection syringe. Henry Fischer, Ilmenau.
 802,390 (December 5, 1921) Injection syringe. Ernst Heidenreich, Augustastrasse 4, Kassel.
 802,550 (July 9, 1921) Rubber sole, heel or part of these. Rheinische Gummi- und Celluloid-Fabrik, Mannheim-Neckarau.
 802,976 (December 9, 1921) Inhaler Friedrich Doppler, Iggelheim, Pfalz.
 803,015 (September 12, 1921) Cloth shoe with rubber sole. Friedrich Theilmann, G. m. b. H., Frankfurt-on-the-Main, Mederard.
 803,141 (October 27, 1921) Rubber heel with leather insert vulcanized into it. Ludwig Bernhardt, Wald, Rhineland.
 803,161 (December 10, 1921) Distendable uterine catheter. Fa. B. Braun, Meisungen.
 803,347 (November 29, 1920) Endless wedge belt. Continental-Cauchouc und Gutta-Percha, Compagnie, Hanover.
 803,452 (December 16, 1921) Rubber sole with hand-shaped leather insert. Paul Wienskowitz, Alexanderstrasse 27, Berlin.
 803,453 (December 16, 1921) Rubber edge with flange continuation covering the entire heel of shoe. Paul Wienskowitz, Alexanderstrasse 27, Berlin.
 803,583 (December 5, 1921) Solid tire for vehicles of soft rubber compound with addition of slag wool which gives the exterior of the tire a rough surface. Gummiwerk Ernst Kniepert, Löbau, Saxony.
 803,587 (December 12, 1921) Rubber heel with inlay. Wilhelm G. Rudolph, Nesenstrasse 4, Frankfurt-on-the-Main.
 803,728 (December 5, 1921) Roller covering for transmission rolls, of soft rubber compound with addition of slag wool which gives the roller covering a rough surface. Gummiwerk Ernst Kniepert, Löbau, Saxony.

BULLET FAILS TO PENETRATE LEE TIRE

An interesting proof has been recently furnished of the durability of the puncture-proof tires manufactured by the Lee Tire & Rubber Co., Conshohocken, Pennsylvania. A bullet fired at one



Lee Puncture-Proof Tire Stops Bullet

of these tires at close range from a .38-caliber Colt revolver failed to pass through the tire, but remained impaled on the puncture-proof disks. An X-ray photograph taken immediately afterward located the bullet.

The London View of the 1921 Crude Rubber Market

From the Annual Reports of S. Figgis & Co. and Lloyd Matheson & Carritt, London, England

THE year 1921 has proved to be a twelvemonth of unprecedented problems and difficulties, due to dull business, accumulating stocks and falling prices throughout the first six months. Its outstanding feature, however, was the fact that during the second six months business improved to such an extent that the year's total crude rubber demand has somewhat exceeded the supply of new rubber. Restricted plantation production, small shipments of wild rubber owing to the low prices obtainable, greatly curtailed reclaiming operations, the reappearance of Germany as a large buyer and increased Japanese activities have all been important factors in this revival.

The collection of wild rubbers has virtually ceased, except on the Amazons and in the Congo, and Pará shipments again show a heavy decline. The reclaiming of old rubber has very largely gone out, and if crude rubber prices continue about as at present it is not likely to revive.

During the first six months of the year crude rubber buying by manufacturers both in England and America was very largely curtailed. Many of the larger firms almost stopped buying as they had made large forward contracts more than sufficient for immediate requirements, and still had large stocks of manufactured goods. The considerable reduction of these latter stocks during the year has been an important factor in enabling the London market to take all the new rubber thrown on it during the year without any serious trouble. Another factor has been the recent revival of the European motor trade, particularly in England, where it has been more pronounced than in America.

Germany has probably taken as much or more rubber than before the war, estimated at 25,000 tons. France has taken about 14,000 tons and Italy 6,000 tons, but Russia and Austria very little. Japan has imported direct from the East more than ever previously, probably quite 20,000 tons.

The World's Total Stocks

Plantation rubber stocks in London and Liverpool have increased from 55,879 tons at the end of 1920 to 78,533 tons at the end of 1921, but stocks in the East and America are estimated to have been reduced by about 40,000 tons altogether, so that all the new rubber received has been consumed and about 18,000 tons—allowing for an increase of some 22,654 tons in England—has been taken from the total stocks of England, America and the East. New York stocks are still considerable,

but the invisible supply in manufacturers' hands is believed to be small, as they have taken deliveries from the ports as they required them.

The world's total visible stock of crude rubber of all descriptions is estimated by Lloyd Matheson & Carritt at 175,000 tons, as against 230,000 tons at the end of 1920. This is only 25,000 tons above what may be regarded a reasonable normal stock when distributed over the world for convenient trading. In detail these stocks are as follows: United Kingdom, 80,000 tons; United States, 70,000 tons; eastern ports, 20,000 tons; European ports, 5,000 tons.

The Market

Beginning the year with the highest prices, 1s. 3½d. per pound for crêpe and 1s. 2d. for sheet, the market declined fairly consistently until in June the lowest prices in rubber history were reached at 8d. per pound for crêpe and 7d. for sheet. In July there was a quick recovery of 2d. per pound, which was partly lost the following month, after which, with exports in excess of imports, a firmer tendency developed with good inquiries from America, prices gradually rising to 11¾d. per pound, which was paid in December for both spot

crêpe and sheet, representing a rise from the lowest price of over 50 per cent. Until July, crêpe commanded a premium of 1d. to 2d. over sheet, but both grades have since realized approximately the same prices. The average price realized during the year was only 10½d. per pound, the average cost of production being at least 50 per cent in excess of that figure.

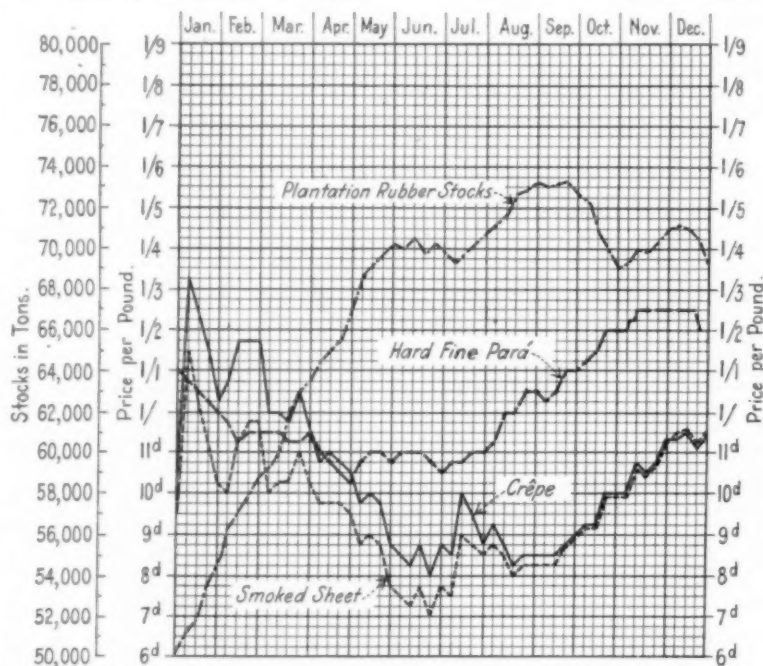
The price of fine hard Pará fell to 10d. per pound in May, but recovered to 1s. 2½d. in November in sympathy with plantations.

The prices in the last three years on December 31 have been as follows:

	Fine Hard Pará	Negrohead Scrapy	Negrohead Island	Caucho Ball
1921	1s. 2d.	7½d.	4d.	8½d.
1920	1s. 0½d.	10½d.	7d.	11d.
1919	2s. 7½d.	1s. 7d.	1s.	1s. 8d.

Sarawak jelutong in small supply is worth £32 per ton c. i. f.; Palembang, £50 per ton c. i. f., and compressed jelutong 9d. per pound.

Balata, unlike other gums, and owing to the small crop, has maintained its high price despite little demand. Sheet f. a. q. is worth about 3s. 6½d. per pound. Venezuela block has been very quiet for months at about 2s. 11d. per pound, although parcels of fine quality have sold well. Good quality Panama is worth about



Lloyd Matheson & Carritt, London

London Prices Smoked Sheet, Crêpe, and Pará, 1921—Weekly Stocks Plantation Rubber—Each Side Large Square = 2,000 Tons; Each Side Small Square = 500 Tons

2s. 5d. per pound, and the supply has been ample for all requirements.

Gutta percha has been in limited demand at steady prices throughout the year.

Plantation Rubber

Quality, Packing and Shipping

Many claims for quality continue from New York on ribbed smoked sheets. It is possible that less care has been taken in preparation and packing, but bad stowage and atmospheric conditions were again sometimes responsible. Cases have often been too frail and have been strained by over-packing. Allowances have been numerous, but often only small. The settlement contract passed by The Rubber Trade Association came into force on December 1, and is suitable for speculative business.

Restricted Production

The agreement by members of the Rubber Growers' Association in October, 1920, to restrict plantation output by 25 per cent continued throughout the year 1921, practically the entire reduction having taken place in Malaya. In November the association issued a circular asking growers to continue the 25 per cent restriction for a further six months, as it is evident that without restrictions more rubber will be produced than is needed at the present, but this has not been passed.

Had restriction of output been continued for a further six months producers would have had the future of the market in their own hands, and it seems certain that the consequent rise in price would have more than compensated growers for diminished output. Restrictions will still be carried out to a certain extent, either voluntarily or possibly even by government control, but the knowledge that no binding agreement exists has already had its effect on the market, although it will be some time yet before the results of freer tapping make themselves felt.

It is argued by some that restriction of output in Malaya and Ceylon would merely benefit the Netherlands Indies, but in 1920 Java and Sumatra furnished only about 17 per cent of the total plantation rubber output. Half of the companies in these islands are British, however, and if they could be induced to join any scheme of restriction, the uncontrolled output in Java and Sumatra would be reduced to well under 10 per cent of the world's total production.

Without restriction during 1921 the output of plantation rubber would probably have amounted to 340,000 tons, but reducing production to less than consumption has enabled the heavy stocks carried over from 1920 to be somewhat reduced, thereby helping the position considerably. With new acreage coming into bearing, and old areas benefiting as a result of resting, the potential output for 1922, subject to difficulties of labor, would probably be between 380,000 and 400,000 tons. What proportion of this quantity will actually be produced it is virtually impossible to estimate with any degree of accuracy.

As occurred a year ago, the Government is considering the advisability of bringing in legislation bearing on the plantation industry. While nobody is eager to see government interference in trade, it seems clear that unless some form of restriction is continued rubber must for many years remain at an unremunerative price. Since the efforts of the Rubber Growers' Association to bring about that restriction have not met with success, the possibility of government intervention cannot be overlooked.

Of the many restriction plans advocated, that which seems to have most to recommend it is a system of universal alternate-day tapping, with resting during the winter months. It is a system which many estates have already adopted voluntarily as a permanent policy. In the opinion of Lloyd Matheson & Carritt and many others it would be fair for all, would reduce output for the next year or two when that is most needed, after which yields would again be equal to those now obtained by tapping. At the same time it would reduce costs, ease the labor position and restore the industry to a condition of prosperity.

Acreage of Plantation Rubber

It is believed that the acreage under rubber did not change during the year 1921, any small fresh plantings having been discounted by the abandonment of some young planted areas. The estimated plantation acreages for the past three years follow:

	1919	1920	1921
Ceylon	300,000	300,000	300,000
Malaya, Malacca	800,000	1,100,000	1,100,000
Borneo	50,000	50,000	50,000
Dutch East Indies	700,000	700,000	700,000
India and Burma	55,000	55,000	55,000
Former German Colonies:			
Samoa, East and West Africa, New			
Guinea, South Sea Islands	8,000	8,000	8,000
Total acres	1,913,000	2,213,000	2,213,000

Lloyd Matheson & Carritt estimate that of the 3,323,000 acres under plantation rubber about two-thirds, or 2,237,500 acres are at present producing. While some new acreage will reach maturity this year it will hardly be a paying proposition on account of high cost due to the small quantity harvested per acre on coming into the tapping round for the first time.

Plantations in India, Burma and Mergui have shipped about the same as last year, although many plantations are restricting. The shipments from Burma were 1,400 tons, against 2,000 tons in 1920. The plantations, principally of Castilloa, in Mexico, West Indies, Central and South America, have almost ceased producing. There have been practically no new arrivals of plantation Ceara from East Africa and Madagascar.

Plantation Production

The total shipments of plantation rubber from the East are estimated at 268,000 tons for the year 1921. The following table shows the chief sources of plantation shipments for the past three years:

	1919	1920	1921
Malaya	219,000	187,800	159,900
Ceylon and India	43,000	37,200	40,100
Java	35,500	31,000	29,600
Sumatra (Belawan)	26,500	22,400	29,900
Totals	*324,000	*278,500	*259,500

*These figures do not include shipments on through bills of lading from "outside" Malay ports via Singapore, that are very difficult to estimate. It is believed that the higher Malayan totals quoted by some authorities are largely accounted for by the transshipment of rubber which appears a second time in the Singapore figures. A new method has been inaugurated for the return of these statistics that is likely to prove more accurate.

South and Central American Rubber

Except from Bolivia and the Amazons, shipments from South and Central America have almost stopped, and what has come has been lying in foreign ports for some time. The supply from the Amazon has fallen off by nearly one-third. Despite this shortage in Pará grades there has been small demand and the market has shown very little activity, dullness in the rubber thread trade being an important factor. Total receipts in Pará from the Amazons for the past three years have been:

	1919	1920	1921
Brazil, Bolivia and Peru	34,300	28,160	20,217
Including Peruvian and Caucho	6,800	6,471	4,843

Guayule production has practically stopped. Imports into New York were only 58 tons.

The balata crop was a small one. Business was small and the market quiet, especially in Venezuela block. Regular supplies have been received from Panama, the quality having improved since the beginning of the year, when it was very inferior.

The following table shows the annual receipts and shipments at Pará during the past three years:

	1919	1920	1921
Receipts of Pará	27,385	21,690	15,374
Receipts of Caucho	6,800	6,471	4,843
Shipments to Europe	11,308	10,761	7,001
Shipments to the United States	27,275	18,262	10,838

African Rubber

Supplies from West Coast districts have almost ceased except for 700 tons from the Congo to Antwerp, which was less than one-third of the 1920 total.

East Indian Rubber

India, Malaya and the Dutch East Indies have almost stopped sending Rambong. Sarawak jelutong has been received in small supply, shipments for the whole year being about 2,400 tons.

British Stocks

British stocks of all sorts on December 31 were 79,843 tons, of which 78,533 tons were plantations and 1,310 tons Pará and Peruvian. This compares with a total of 56,499 tons at the end of 1920, of which 55,879 tons were plantation and 620 tons Pará and Peruvian. British imports of all sorts for the year were 86,551 tons, and deliveries 63,207 tons. Of these, 4,398 tons imported and 3,708 tons delivered were Pará and Peruvian. In 1920 British imports totaled 103,095 tons, and deliveries 71,046, while Pará and Peruvian imports were 7,285 tons and deliveries 7,435 tons.

The increase in British stocks has been due in large measure to the policy adopted by consumers of late to buy in the country of production instead of in London. As London is still the governing factor in the world's rubber market, these stocks have a depressing effect on prices everywhere. These stocks are firmly held, however, probably 90 per cent of the quantity having been bought and paid for by manufacturers, dealers or speculators. It is doubtful whether a few pence rise in the market would find much of these stocks available for trade purposes. The balance of 10 per cent may be regarded as the quantity becoming available as shipments arrive from the plantations. Since last August stocks have been gradually decreasing, and with consumption in excess of restricted production the time will come when these stocks will have to be drawn upon. Then it will be seen how little is really available, and prices will rise accordingly.

Dutch Stocks

For the year ended October 31, 1921, Dutch imports of all descriptions were 14,857 tons, and exports, 10,834 tons. Stocks of all descriptions on October 31, 1921, were 8,941 tons.

American Imports

Imports of all descriptions into the United States were estimated by the Rubber Association of America to total 187,363 tons in 1921, against 215,620 tons in 1920, and 226,032 tons in 1919. Of the 1921 imports, 173,195 tons were plantations; 10,915 tons Pará; 2,329 tons Africans; 86 tons centrals, and 58 tons guayule.

World's Rubber Production and Consumption

Owing to the absence of complete and authoritative statistics the world's crude rubber production is variously estimated. S. Figgis & Co. estimate total production at about 296,000 tons for 1921, as against 305,000 tons for 1920, 268,000 tons being plantations, 20,000 tons being Brazilian, and 8,000 tons being other wild rubbers.

Lloyd, Matheson & Carritt estimate the world's total production for 1921 at 270,000 tons, against 345,000 tons in 1920, a decrease of approximately 20 per cent. Of this output plantation rubber is estimated at 250,000 tons, against 310,000 tons in 1920, a decrease of 60,000 tons; Brazilian and wild rubber, 20,000 tons against 29,000 tons in 1920, a reduction of 50 per cent and the smallest quantity imported in the past twenty years.

The same firm estimates U. S. consumption of all grades at 200,000 tons, and that of the rest of the world 100,000 tons. As to the probable consumption in 1922, it is believed unlikely to fall short of last year, and it is pointed out that for the nine years prior to 1921 the average increase of consumption was over 20 per cent. New uses of rubber seem likely to become a factor, and the efforts of manufacturers to produce automobiles at prices within the reach of the many promise to increase the tire business in England and France. The set-back of the past eighteen months is not the first the rubber industry has experienced, although it

is the most severe. It seems certain that the limit of the world's rubber demand has not yet been reached and that in time the world will require all the rubber the industry can produce.

The Antwerp 1921 Crude Rubber Market¹

During the year 1921 the volume of business in the Antwerp crude rubber market was less than one-third of that for the year 1920.

Imports of all sorts for the year 1921 amounted to only 907,753 kilos against 2,925,250 kilos in 1920, 2,283,772 kilos in 1919, and 5,039,509 kilos in 1913. Of the 1921 total, 712,709 kilos was Belgian Congo and other grades, against 2,304,162 kilos in 1920, 2,233,889 kilos in 1919 and 3,006,470 kilos in 1913. The balance of the 1921 total, amounting to 195,044 kilos, was plantation sorts, against 621,088 kilos in 1920, 49,883 kilos in 1919, and 2,033,039 in 1913.

The severe decrease in total imports is explained, in so far as Congo and miscellaneous sorts are concerned, by the unexpected great drop in prices which had the effect of stopping exports of all sorts. As for plantations, the companies have sold the major part of their production at the source because of exchange conditions.

The entire market was especially affected by the depreciation of Belgian currency and violent exchange fluctuations which exposed importers to risks without number. They have thus preferred temporarily to sell their products in the Far East, although transactions on the Singapore market have given cause for serious discomfiture.

The quality of Congo rubber remains excellent, but having shared the lack of demand of inferior sorts, it is presumed that when prices improve the importation of vine rubber especially will again be considered.

Planters are striving to reduce production costs as much as possible and have for the most part stopped the collection of inferior qualities. This fact is renewing activity in Congo sorts which the industry is now seeking to replace inferior plantation grades.

As for the product of Hevea plantations in the Congo, whose crop is becoming interesting, its quality yields nothing to the best products of the Far East. The best lots come in the form of ribbed smoked sheets. The attention of planters is directed, however, to the dangers of over-smoking, which renders rubber resinous and removes part of its value, and also to the importance of thorough drying before packing in order to avoid moisture which depreciates the rubber fully as much.

Until late in the year the decline in prices continued unabated. After one temporary recovery the price of first latex fell below one shilling in March, causing the general retirement of buyers, and at the end of August prices touched their lowest level at eight pence for first latex and seven pence for sheet.

This depressing situation was above all the result of the world crisis affecting all branches of commerce and industry, aggravated further by the forced and absolute abstention of Europe, thus putting the entire market at the mercy of the United States, this absence of buyers causing a serious break in prices.

Toward the end of the year, owing to the salutary effect of crop restriction, a slow but sure recovery of prices manifested itself, not based exclusively on speculation in futures, but emanating from the consumer, who, following his long abstention, willingly or not, was obliged to resume buying. Firmness soon became more and more apparent and the year closed on a rising market.

Prices at the end of December, 1921, showed a further decrease of 12½ to 40 per cent in Congo grades as compared with prices at the end of December 1920, whereas prices of fine Pará

¹From report of Grisar & Co., Antwerp, Belgium.

had advanced 4 per cent and of plantations about 10 per cent. Thus black Kassai, black upper Congo, ordinary, and upper Congo, grade Oubangui, which at the end of 1920 sold at 5 francs, dropped to 4.25 francs at the close of 1921; red Kassai, grade Loanda II, brought 3 to 3.25 francs against 3.75 the year before. Red Congo Wamba was quoted at 2.75 to 2.90 francs as against 3.60 francs. Red thimbles showed the greatest drop at 1 to 1.15 francs as compared with 2 francs at the end of 1920. Fine Pará advanced from 1s. 1d. to 1s. 2d.; plantation crepê 1, from 10d. to 11½d., and plantation sheet from 10¾d. to 11½d.

The futures market which suffered from violent price fluctua-

tions, the lack of available plantation rubber and unfavorable and uncertain exchange conditions, has been quiet throughout the year and transactions very limited. Following the improved trend in prices late in the year, sellers have shown less interest in futures. On December 30 futures were quoted as follows: January, 5.75 francs; February, 5.80; March, 5.85; April, 5.90; May, 5.95; June-November, 6.

Importers in the Antwerp market approve of the request of the Rubber Growers' Association to continue the 25 per cent voluntary crop restriction for another six months and believe that without restriction the planting industry will find itself in further difficulties from which it will not easily emerge.

United States Crude and Waste Rubber Imports for 1921 (By Months)

1921	Plantation	Pará	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals		Balata	Miscellaneous	Waste
							1921	1920			
January	12,819	1,312	43	3	....	....	14,177	21,351	41	173	1,071
February	7,913	432	269	2	25	....	8,641	32,994	25	216	37
March	12,241	1,794	377	1	....	3	14,416	31,650	29	7	345
April	16,861	403	....	5	....	....	17,269	23,675	64	226	7
May	9,127	1,570	....	2	33	....	10,732	27,338	40	186	41
June	12,361	1,091	....	25	....	....	13,477	14,881	49	203	72
July	11,140	495	27	30	....	....	11,692	15,884	25	189	34
August	13,031	899	41	3	....	....	13,974	15,564	21	102	22
September	14,653	416	15	4	....	....	15,068	11,636	41	211	99
October	21,602	990	874	3	....	....	23,469	10,639	45	400	17
November	18,631	916	190	1	....	....	19,738	6,448	97	351	88
December	23,596	597	493	2	....	3	24,690	11,020	104	176	6
Totals, 12 months, 1921, tons	173,975	10,915	2,329	81	58	5	187,363	.....	581	2,440	1,839
Totals, 12 months, 1920, tons	196,972	18,391	3,881	713	1,037	86	.....	221,080	581	8,113	4,989

Compiled by The Rubber Association of America, Inc.

Exports of India Rubber and Caucho from Manáos and Iquitos During the Year 1921

EXPORTERS	Europe					New York					Grand Totals
	Fine	Medium	Coarse	Caucho	Totals	Fine	Medium	Coarse	Caucho	Totals	
Ohliger & Co.,	431,810	34,569	51,101	227,885	745,365	1,012,024	148,369	169,758	527,733	1,857,884	2,603,249
General Rubber Co. of Brazil,	343,442	55,372	33,701	62,485	495,000	1,154,776	91,079	219,815	545,330	2,011,000	2,506,000
Tancredi Porto & Co.,	685,914	38,020	38,809	98,460	861,203	911,633	136,793	208,933	311,388	1,568,747	2,429,950
Stowell & Co.,	464,031	30,649	4,639	249,350	748,669	470,511	24,004	85,097	185,596	765,208	1,513,877
Vianna, Lyra & Co.,	526,530	38,420	51,332	234,282	850,564	132,587	15,868	20,012	30,385	198,852	1,049,416
J. G. Araujo,	55,151	3,646	8,793	49,839	117,427	10,291	.....	397	94,734	105,422	222,851
Companhia Fluvial,	130,581	4,309	18	.....	134,908	.....	.....	.....	.....	.....	134,908
Semper & Co.,	64,365	4,960	5,828	4,440	79,593	11,696	.....	2,945	25,120	39,755	119,348
Higson, Jones & Co.,	34,080	2,560	11,230	19,360	67,230	.....	.....	.....	.....	.....	67,230
B. Levy & Co.,	16,790	4,278	4,307	768	26,143	.....	740	6,838	2,093	9,671	35,814
Simfronio & Co., .....	.....	.....	.....	.....	.....	.....	12,160	15,840	.....	28,000	28,000
Wilson, Holgate & Co. (Brazil), Limited, .....	.....	.....	.....	25,987	25,987	.....	.....	.....	.....	.....	25,987
Grandi & Co., .....	.....	.....	.....	5,578	5,578	.....	.....	.....	.....	.....	5,578
M. Corbacho & Co., .....	.....	.....	.....	.....	.....	1,345	199	366	.....	2,010	2,010
J. Carneiro da Motta, .....	.....	.....	.....	.....	.....	1,700	.....	.....	100	1,700	1,700
L. S. Corrêa, .....	.....	.....	.....	.....	.....	500	.....	.....	.....	500	500
Ferreira Costa & Co., .....	.....	.....	.....	58	58	.....	.....	.....	.....	.....	58
In transit from Iquitos,	2,752,694	216,783	209,758	978,492	4,157,727	3,707,057	429,212	730,001	1,722,479	6,588,749	10,746,476
Totals,	2,781,895	260,209	214,894	1,059,674	4,316,672	3,734,447	475,851	737,148	1,747,881	6,695,327	11,011,999

Destinations

	New York	Liverpool	Hamburg	Havre	Brazil (South)	Antwerp	London	Genoa	Barcelona	Totals
From Manáos	6,552,116	1,420,112	1,487,013	1,182,570	37,872	34,995	25,987	5,696	115	10,746,476
Iquitos	106,578	113,873	44,581	491	.....	.....	.....	.....	.....	265,523
Totals,	6,658,694	1,533,985	1,531,594	1,183,061	37,872	34,995	25,987	5,696	115	11,011,999

Exports of India Rubber and Caucho from Pará During the Year 1921

EXPORTERS	Europe					New York					Grand Totals
	Fine	Medium	Coarse	Caucho	Totals	Fine	Medium	Coarse	Caucho	Totals	
Berringer & Co.,	774,760	27,210	25,685	207,800	1,035,455	716,301	152,765	387,387	214,923	1,471,376	2,506,831
General Rubber Co. of Brazil,	185,192	24,705	30,118	11,177	251,192	751,133	35,017	417,697	192,548	1,396,395	1,647,587
Bitar, Irmãos,	505,721	9,949	2,866	406,079	924,615	337,003	66,744	100,465	48,883	553,095	1,477,710
Suarez, Filho & Co.,	44,169	3,119	1,021	7,757	56,066	376,375	.....	6,526	111,852	494,753	550,819
F. Chamié, .....	.....	.....	.....	15,852	441,030	316,859	3,640	168,177	38,953	527,029	527,029
Jos. Origet & Co.,	379,812	25,054	20,312	.....	425,178	.....	.....	.....	.....	.....	441,030
Amazon River S. N. Co.,	151,479	6,903	43,378	59,670	261,430	.....	.....	.....	.....	.....	261,430
Ferreira Costa & Co., .....	.....	.....	.....	.....	.....	57,460	21,019	51,500	104,000	233,979	233,979
Stowell & Co.,	95,592	3,431	.....	.....	99,023	94,948	5,633	28,269	687	129,537	238,560
J. Marques,	106,591	.....	.....	52,500	159,091	.....	.....	.....	.....	.....	164,531
Adelbert H. Alden, Limited,	123,133	3,464	5,315	6,550	138,462	11,390	.....	.....	.....	11,390	149,852
Chamié & Koury, Limited,	52,619	5,708	30,189	5,183	93,699	17,340	990	2,310	.....	20,640	114,339
S. Marques & Co., .....	.....	.....	.....	.....	.....	6,554	242	9,122	9,750	25,668	25,668
Benchimol & Irmão, .....	.....	.....	.....	4,446	4,446	7,820	1,020	4,740	.....	13,580	18,026
Wilson Holgate & Co., .....	.....	.....	.....	.....	.....	.....	.....	.....	13,500	13,500	13,500
Pires Guerreiro & Co.,	4,080	340	3,040	.....	7,460	.....	.....	.....	.....	7,460	7,460
Anglo Brazilian Com. & Agency Co.,	1,080	.....	920	.....	2,000	4,420	.....	1,320	.....	5,740	5,740
Various, .....	.....	.....	.....	.....	.....	790	.....	.....	.....	790	2,790
Totals,	2,424,228	109,883	162,844	777,014	3,473,969	2,703,833	286,470	1,177,513	735,096	4,902,912	8,376,881

Destinations

	New York	Havre	Liverpool	Hamburg	Genoa	Brazil (South)	Rotterdam	Barcelona	Total
From Pará	4,740,966	1,469,089	871,517	829,459	254,656	161,946	36,206	13,042	8,376,881

Compiled by Ohliger & Co., Manáos, and Berringer & Co., Pará, Brazil.

Review of the Crude Rubber Market

New York

DURING the week of January 28 the crude rubber market experienced a sharp drop of 2 cents a pound. Spot first latex crêpe and ribbed smoked sheets offered at 17 cents on Monday sold at 15 cents on Friday. This stimulated factory buying and the week was the most active encountered for months in the rubber trade. The chief cause of the price slump was heavy selling by large London operators and the calling of loans by London banks during the slump.

The week ended February 4 was marked by weak markets in both New York and London, and continued active buying on the part of factories. On firmer London prices the dealers turned buyers with few sellers in the market. The advance of one cent a pound caused the factories to reduce purchases to smaller proportions. Higher prices are expected for April-June if exchange continues firm.

The week ended February 11 was very quiet as a whole, the feature of the week being the rise in sterling. Sales were very limited, as a rule.

The week ended February 18 proved very dull and quiet with few price changes. There was some scattered factory buying. There was little or no trading among dealers except in odd quantities. Toward the close of the week exchange rose and this caused withdrawal of sellers and stiffening of the market. Dealers bid $\frac{1}{2}$ cent over prices quoted to factories but with the firm London market and exchange it was difficult to import rubber with profit. Rubber bought at 19 and 20 cents is being held for a rise in price that will admit sales at a profit.

Parás ruled dull; balatas, weak and were not in factory demand.

Importations of all grades during January were 21,867 tons compared with 14,177 tons for January one year ago. Plantation arrivals for January were 20,774 tons compared with 12,819 tons for January one year ago.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATIONS. February 4. Spot, first latex crêpe, 16 cents; April-June, 17 cents; July-September, 18 cents; July-December, 19 cents. February 21. Spot, first latex crêpe, 15 $\frac{1}{4}$ cents; April-June, 16 $\frac{1}{2}$ cents; July-September, 17 $\frac{1}{2}$ cents; July-December, 18 $\frac{1}{4}$ cents.

February 4. Spot, ribbed smoked sheets, 16 cents; April-June, 17 cents; July-September, 18 cents; July-December, 19 cents. February 21. Spot, ribbed smoked sheets, 15 $\frac{1}{4}$ cents; April-June, 16 $\frac{1}{2}$ cents; July-September, 17 $\frac{1}{2}$ cents; July-December, 18 $\frac{1}{4}$ cents.

February 4. Spot, No. 1 amber crêpe, 16 cents; April-June, 17 cents. February 21. Spot, No. 1 amber crêpe, 15 cents; April-June, 16 cents.

February 4. Spot, No. 1 rolled brown crêpe, 14 cents; April-June, 14 $\frac{3}{4}$ cents. February 21. Spot, No. 1 rolled brown crêpe, 13 $\frac{1}{4}$ cents; April-June, 14 cents.

SOUTH AMERICAN PARÁS AND CAUCHO. February 4. Spot, upriver fine, 17 cents; islands fine, 16 cents; upriver coarse, 12 $\frac{1}{2}$ cents; islands coarse, 7 $\frac{1}{2}$ cents; Cametá, 8 $\frac{1}{2}$ cents; cauchó ball, 11 $\frac{3}{4}$ -12 cents. February 21. Spot, upriver fine, 18 $\frac{1}{4}$ cents; islands fine, 17 cents; upriver coarse, 13 cents; islands coarse, 8 cents; Cametá, 9 $\frac{1}{2}$ cents; cauchó ball 11-12 cents.

London

The week ended February 4 witnessed a slight decline in ribbed smoked sheets from 9 $\frac{1}{4}$ d. at the opening to 8 $\frac{3}{4}$ d. at the close of the week. Exchange rising in the same period from \$4.27 $\frac{1}{2}$ to \$4.34 $\frac{1}{2}$.

For the week ended February 11 ribbed smoked sheets opened at 8 $\frac{3}{4}$ d., advancing to 8 $\frac{1}{2}$ d. on Wednesday and Thursday and falling to 8 $\frac{1}{4}$ d. for the remaining days of the week. By the middle of the week exchange had risen to \$4.39, but fell to \$4.32 $\frac{1}{4}$ at the end.

For the week ended February 18 the prices on ribbed smoked sheets remained very steady, varying from 8 $\frac{1}{4}$ d. to 8 $\frac{3}{4}$ d. Exchange was at lowest the middle of the week at \$4.35 $\frac{1}{4}$ and closed the week at \$4.37 $\frac{1}{4}$. London prices for first latex ruled $\frac{1}{4}$ d. higher than for ribbed smoked sheets.

The London market experienced a bad slump during the week of January 28 which seriously affected New York values and brought prices down about 2 cents a pound from which they are not yet recovered.

New York Quotations

	March 1, 1921	February 1, 1922	February 21, 1922
Plantation Hevea			
Following are the New York spot quotations, for one year and one month ago, and February 21, the current date:			
First latex crêpe.....	\$0.20 @.20 $\frac{1}{2}$	\$0.16 $\frac{1}{2}$ @	\$0.15 $\frac{1}{4}$ @
Off latex crêpe.....	@	.16 @	.14 $\frac{1}{2}$ @.14 $\frac{3}{4}$
Amber crêpe No. 1.....	.16 $\frac{1}{2}$ @.16 $\frac{1}{2}$	.16 @	.15 @.15 $\frac{1}{4}$
Amber crêpe No. 2.....	.15 $\frac{1}{2}$ @.15 $\frac{1}{2}$	.15 $\frac{1}{2}$ @	.14 $\frac{1}{2}$ @
Amber crêpe No. 3.....	.14 $\frac{1}{2}$ @.14 $\frac{1}{2}$	.15 $\frac{1}{4}$ @	.14 $\frac{1}{2}$ @
Brown crêpe, thick and thin.....	.13 @.13 $\frac{1}{2}$	.15 $\frac{1}{4}$ @	.14 @
Brown crêpe, specky.....	.11 @.12	.15 $\frac{1}{2}$ @	.13 @
Brown crêpe, rolled.....	.12 $\frac{1}{2}$ @.13	.15 @	.13 $\frac{1}{2}$ @.13 $\frac{1}{2}$
Smoked sheet, ribbed.....	.18 $\frac{1}{2}$ @.19	.16 $\frac{1}{2}$ @	.15 $\frac{1}{2}$ @.15 $\frac{1}{2}$
Smoked sheet, plain.....	.17 $\frac{1}{2}$ @	.15 $\frac{1}{2}$ @	.14 $\frac{1}{2}$ @.14 $\frac{1}{2}$
Unsmoked sheet.....	.16 $\frac{1}{2}$ @	.15 @	.14 @.14 $\frac{1}{2}$
Colombo scrap No. 1.....	.12 @	@	.13 $\frac{1}{2}$ @.14
Colombo scrap No. 2.....	.10 @	@	.13 @

East Indian

Assam crêpe.....	@	@	@
Assam unions.....	@	@	@
Penang block scrap.....	@	@	@
Pontianak			
Banjer massin.....	.07 @.08	.08 $\frac{1}{2}$ @	.08 $\frac{1}{2}$ @
Palembang.....	@	.10 $\frac{1}{4}$ @	.10 $\frac{1}{2}$ @
Pressed block.....	.11 $\frac{1}{4}$ @.12 $\frac{1}{4}$	.13 @	.13 @
Serassak.....	.06 $\frac{1}{2}$ @	.07 @	.08 @

South American

PARÁS			
Upriver, fine.....	.17 $\frac{1}{2}$ @.18	.20 @	.18 @.18 $\frac{1}{4}$
Upriver, medium.....	.15 @	.17 $\frac{1}{2}$ @	.17 @
Upriver, coarse.....	.12 $\frac{1}{2}$ @.13 $\frac{1}{2}$	.13 @	.13 @
Upriver, weak, fine.....	.12 @.13	.17 @	.15 @.16
Islands, fine.....	.17 $\frac{1}{2}$ @.18	.19 @	.17 @.17 $\frac{1}{4}$
Islands, medium.....	.15 @	.17 @	.15 @.15 $\frac{1}{2}$
Islands, coarse.....	.11 @	.09 $\frac{1}{2}$ @	.08 @
Cametá.....	.11 $\frac{1}{2}$ @.12	.09 $\frac{1}{2}$ @	.09 $\frac{1}{2}$ @.10
Acre Bolivian, fine.....	.18 @.18 $\frac{1}{2}$	.21 @	.18 $\frac{1}{2}$ @
Madeira, fine.....	.18 $\frac{1}{2}$ @.20	.22 @	.19 @.19 $\frac{1}{4}$
Beni Bolivian.....	@	.21 @	.18 $\frac{1}{2}$ @.19
Peruvian, fine.....	.16 @.17	.19 @	.17 @.17 $\frac{1}{2}$
Tapajós, fine.....	.16 $\frac{1}{2}$ @.17	.19 @	.17 @.17 $\frac{1}{2}$

Parás—Washed and Dried

(Shipment from Brazil)			
Acre Bolivian fine (crêpe).....	@	.32 $\frac{1}{4}$ @	.30 @
Upriver, fine.....	@	.32 $\frac{1}{4}$ @	.30 @
Xingu fine (crêpe).....	@	.29 $\frac{1}{2}$ @	.27 @
Cametá (crêpe).....	@	.21 @	.19 $\frac{1}{2}$ @

Cancho

Upper cauchó ball.....	.14 $\frac{1}{2}$ @.15	.12 @	.12 $\frac{1}{2}$ @.12 $\frac{1}{2}$
Lower cauchó ball.....	.12 $\frac{1}{2}$ @.13	.11 @	.11 $\frac{1}{2}$ @

Maniçobas

Ceará negro heads.....	*.13 @	*.11 @	*.11 @
Ceará scrap.....	*.10 @	*.07 @	*.07 @
Maniçoba 30% guaranty.....	*.12 $\frac{1}{2}$ @	*.08 $\frac{1}{2}$ @	*.08 $\frac{1}{2}$ @
Mangabeira thin sheet.....	*.15 @	*.14 @	*.14 @

Centrals

Corinto scrap.....	.12 @	.13 @	.09 @.11
Central scrap.....	.12 @	.13 @	.08 @.10
Central scrap and strip.....	.10 @.11	.10 @	.07 @.09
Central wet sheet.....	.06 @.07	.04 @	.03 @.04
Emerald sausage.....	.12 @	.13 @	.09 @.11
Guayule, 20% guaranty.....	@	@	@
Guayule washed and dried.....	*.26 @	.26 @	.26 @

*Nominal.

Africans	March 1, 1921	February 1, 1922	February 21, 1922
Benguela, No. 1, 28½%	@	@	.09 @
Benguela, No. 2, 32½%	.07 @	*.07 @.08	@
Conakry niggers.....	@	@	.18 @
Congo prime, black upper	*.15 @	@	.15½ @
Congo prime, red upper.	*.12 @	@	.15½ @
Kassai black.....	@	*.11 @.12	.15½ @
red.....	@	*.11 @.12	.15½ @
Massai sheets and strings	@	@	.18 @
Niger flake, prime.....	*.17 @	@	.14½ @
Rio Nunez ball.....	@	@	@
Rio Nunez sheets, strings	@	@	.18 @
Gutta Percha			
Gutta Siak.....	.17 @	.17½ @.18½	.18½ @
Rel Macassar.....	2.10 @3.00	2.75 @3.00	2.80 @
Balata			
Block, Ciudad, Belivar..	.60 @.61	.55 @	.52 @.53
Colombian.....	.45 @.46	.43 @	.40 @.42
Panama.....	.45 @.46	.43 @	.25 @.38
Surinam sheet.....	.69 @.70	.68½ @	.63 @.64
amber.....	.84 @	.72 @	.68 @.70

*Nominal.

Comparative Low and High New York Spot Rubber Prices

Plantations	1922*	February 1921	1920
First latex crepe.....	\$0.15 @ \$0.16½	\$0.20 @ \$0.19½	\$0.51½ @ \$0.46½
Smoked sheet, ribbed .15 @ .16½	.19 @ .17½	.51½ @ .46	
Paras			
Upriver fine.....	.16½ @ .18½	.17½ @ .17	.46 @ .42½
Upriver, coarse.....	.12 @ .13½	.14 @ .13½	.34 @ .31½
Islands, fine.....	.16 @ .17½	.17½ @ .17	.44½ @ .42
Islands, coarse.....	.07½ @ .10	.11½ @ .11	.21 @ .20½
Cametti.....	.07 @ .12	.12 @ .11	.23½ @ .21½

*Figured to February 21, 1922.

Amsterdam Rubber Market

JOOSTEN & JANSSEN, Amsterdam, report under date of February 3, 1922:

A sharp recovery in the earlier part of this week was quickly lost again. Producers generally kept out of the market and dealers were only reluctant sellers, consequently only a small business took place on the spot, prices for same remaining relatively high, as there was constantly good demand for all qualities.

In the terminal market supply was rather liberal, especially for the more distant deliveries, and a fair turnover resulted but only in crepe.

The close is about 5 cents below the top of the week:

Hevea crepe, Fl. .48	Sheets, Fl. .48	spot.
Hevea crepe, Fl. .50	Sheets, Fl. .50½	April to June.
Hevea crepe, Fl. .52	Sheets, Fl. .52½	July to September.
Hevea crepe, Fl. .53½	Sheets, Fl. .54½	October to December.

Reclaimed Rubber

Owing to the recession in the prices of crude rubber the latter part of January and continued weakness, the demand for reclaims has been reduced considerably and crude substituted in many mechanical and other lines. The result is that the reclaiming plants are operating at not much over 25 per cent capacity. As a whole the business in reclaim has dropped back to the conditions prevailing last fall.

The steady improvement reported from the various rubber manufacturing centers is thus not shared by the reclaiming industry at the present time. The quotations below are nominal.

New York Quotations

FEBRUARY 21, 1922

Prices subject to change without notice.

Standard Reclaims		
Floating.....	\$0.12 @ \$0.13	
Friction.....	.12 @ .13	
Mechanical.....	.09 @ .11	
Shoe.....	.10½ @ .10¾	
Tires, auto.....	.09 @ .10	
truck.....	.09 @ .10	
White.....	.13 @ .14	

Singapore Rubber Market

GUTHRIE & CO., Limited, Singapore, report, under date of January 12, 1922:

The period under review has been noted for a dull market, business, prior to the opening of the auctions yesterday, having been of negligible proportions. At the auctions a fair demand was disclosed at prices a shade easier on the week. Standard sheet was not in good demand, only a few special marks fetching the top price of 37½ cents. Good F. A. Q. sheet was in request at 36½ to 37 cents, off quality sheet being salable round about previous prices. Fine pale crepe shows no change, but the demand was not good, off quality lots being salable only at bargain prices. Lower grade crepes declined ½ cent. Of 718 tons cataloged, 506 tons were sold. The following is the course of values:

	In Singapore per pound	Sterling Equivalent per Pound in London
Sheet, fine ribbed smoked.....	37½ @ 37	1/-
Sheet, good F. A. Q.....	36½ @ 36	—/11½ @ —/11½
Sheet, off quality.....	32½ @ 36	—/10½ @ —/11½
Crepe, fine pale.....	37	1/0½
Crepe, good pale.....	34 @ 36½	—/11½ @ 1/0½
Crepe, off quality.....	30 @ 33½	—/10½ @ —/11½
Crepe, fine brown.....	32½ @ 33	—/11 @ —/11½
Crepe, good brown.....	28 @ 32	—/9½ @ —/10½
Crepe, dark.....	26½ @ 30	—/9½ @ —/10½
Crepe, bark.....	25½ @ 27	—/9½ @ —/9½

British Malaya Rubber Exports

An official cablegram from Singapore states that 41,113,900 pounds of rubber (18,354 tons) were exported from British Malaya in the month of December, 1921, as against 40,188,800 pounds (17,941 tons) in November. Transshipments amounted to 3,711,400 pounds (1,657 tons) against 2,973,800 pounds (1,328 tons) in November last.

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

January, 1922

PLANTATIONS	3	4	5	6	7	9	10	11	12	13	14	16	17	18	19	20	21	23	24	25	26	27	28	30	31
Sheet																									
Ribbed smoked.....	20½	20½	19½	19½	19½	19½	19½	19½	19	18½	18½	19½	18½	18½	17½	17½	16½	16½	16½	16	16	15½	15½	16½	16½
Crepe																									
First latex.....	20½	20½	19½	19½	19½	19½	19½	19½	18½	18½	18½	18½	18½	17½	17½	17	16½	16½	16½	15½	16	15½	15½	16½	16½
Off latex.....	19½	19½	18½	18½	18½	18½	18½	18½	18½	17½	17½	18½	18½	17½	17½	16½	16½	16½	16½	15½	15½	14½	15½	15½	15½
No. 1 blanket.....	19½	19½	18½	18½	18½	18½	18½	18½	18½	18½	18½	18½	18½	17½	17½	16½	16½	16½	16½	15½	15½	14½	15½	15½	15½
No. 2 blanket.....	19½	18½	18½	18	18	18	18½	18	17½	17½	17½	17½	17½	16½	16½	16½	16½	15½	15½	15½	14½	15½	15½	15½	15½
No. 3 blanket.....	18½	18½	18½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	16½	16½	15½	15½	15½	14½	14½	14½	14½	15½	15½	15½
Thin, clean, brown.....	19	18½	18½	18½	18½	17½	17½	17½	17½	17½	17½	17½	17½	16½	16½	15½	15½	15½	14½	14½	14½	14½	15½	15½	15½
Specky brown.....	18½	18½	17½	17½	17½	17½	17½	17½	17½	16½	16½	16½	16½	15½	15½	14½	14½	14½	14½	14½	14½	14½	14½	14½	14½
Roller brown.....	18½	17½	17½	17½	17½	17½	17½	17½	17	16½	16½	16½	16½	15½	15½	14½	14½	14½	14½	14	13½	13½	13½	13½	14½

February, 1922

PLANTATIONS	1	2	3	4	6	7	8	9	10	11	13	14	15	16	17	18
Sheet																
Ribbed smoked.....	16½	15½	15½	16½	15½	16½	16½	15½	15½	15½	....	15½	15½	15½	15½	15½
Crepe																
First latex.....	15½	15½	15½	15½	15½	16	16½	15½	15½	15½	....	15½	15½	15½	15½	15½
Off latex.....	15½	14½	15½	15½	15½	15½	15½	15½	15½	15½	....	14½	14½	14½	14½	14½
No. 1 blanket.....	15½	15½	15½	15½	15½	16	16	15½	15½	15½	....	15½	15½	15½	15½	15½
No. 2 blanket.....	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	....	15½	15½	15½	15½	15½
No. 3 blanket.....	15½	14½	14½	14½	14½	14½	14½	14½	14½	14½	....	14½	14½	14½	14½	14½
Thin, clean, brown.....	15	14½	14½	15	15	15½	15½	15	14½	14½	....	14½	14½	14½	14½	14½
Specky brown.....	14½	13½	14½	14½	14½	14½	14½	14½	14½	14½	....	14	13½	13½	13½	13½
Roller brown.....	14½	13½	14½	13½	13½	13½	14½	14	13½	13½	....	13½	13½	13½	13½	13½

*Holiday.

Plantation Rubber Exports from Java*

	November		Eleven Months Ended November 30	
	1920	1921	1920	1921
To Netherlands.....kilos	486,000	111,000	4,593,000	4,999,000
Great Britain	720,000	246,000	8,063,000	7,054,000
Germany	20,000	123,000	109,000	603,000
United States.....	751,000	2,178,000	11,537,000	11,443,000
Singapore	645,000	245,000	4,169,000	2,619,000
Japan	10,000	13,000	194,000	281,000
Australia	44,000	.....	234,000	211,000
Other countries	37,000	.....	202,000	161,000
Totals	2,713,000	2,916,000	29,101,000	27,371,000
Ports of Origin:				
Tandjong Priok.....kilos	1,604,000	1,448,000	13,717,000	12,132,000
Samarang	44,000	42,000	475,000	433,000
Soerabaya	825,000	1,345,000	13,827,000	12,698,000

*The October figures are verified.

Crude Rubber Arrivals at Atlantic Ports as Stated by Ships' Manifests
Parás and Caucho at New York

	Fine	Medium	Coarse	Caucho	Totals
					Pounds
JANUARY 19. By the S. S. "Glenaffric," from Pará.					
L. Littlejohn & Co., Inc.	58,210	.....	.....	.....	58,210
JANUARY 19. By the S. S. "Glenaffric," from Manáos.					
Fred Stern & Co.	.....	15,078	.....	.....	15,078
JANUARY 22. By the S. S. "Michael," from Pará.					
Schafer & Meyer	46,835	.....	.....	.....	46,835
Schafer & Meyer	2,314	.....	2,821	4,408	19,543
Meyer & Brown, Inc.	47,040	.....	.....	.....	47,040
JANUARY 22. By the S. S. "Michael," from Manáos.					
Paul Bertuch	.....	.....	1,411	.....	1,411
Fred Stern & Co.	.....	13,479	.....	.....	13,479
JANUARY 22. By the S. S. "Michael," from Pará and Manáos.					
Poel & Kelly, Inc.	38,099	3,025	17,398	.....	*85,322
FEBRUARY 6. By the S. S. "Dunstan," from Manáos.					
Poel & Kelly, Inc.	7,495	.....	21,859	46,161	75,515
Paul Bertuch	25,751	3,012	13,600	46,556	88,919
Fred Stern & Co.	.....	.....	103,145	27,648	130,793
FEBRUARY 6. By the S. S. "Dunstan," from Pará.					
F. R. Henderson & Co., Inc.	11,300	.....	.....	22,500	33,800
H. A. Astlett & Co.	60,000	.....	28,000	5,000	93,000
FEBRUARY 12. By the S. S. "Sallust," from Pará.					
Paul Bertuch	194,774	10,268	1,704	.....	206,746
L. Littlejohn & Co., Inc.	26,191	.....	.....	.....	26,191
FEBRUARY 12. By the S. S. "Stephen," from Pará.					
Paul Bertuch	96,094	25,852	.....	.....	121,946
General Rubber Co.	.....	.....	44,800	.....	*67,200

*Includes Cameté.

†Washed and dried in Brazil.

Plantations

(Figured at 180 pounds net to the bale or case.)

	Shipment from:	Shipped to:	Pounds	Totals
JANUARY 13. By the S. S. "Promus" at New York.				
Various	Batavia	New York	170,520	170,520
JANUARY 15. By the S. S. "West Canon" at New York.				
McCall & Co.	Batavia	New York	19,980	
Jaeger & Co.	Batavia	New York	57,780	
Thornett & Fehr, Inc.	Batavia	New York	5,940	
Irwin-Harrisons Crossfield, Inc.	Batavia	New York	171,720	
H. Muehlstein & Co.	Batavia	New York	50,220	
General Rubber Co.	Soerabaya	New York	29,520	
Jaeger & Co.	Soerabaya	New York	170,100	
A. C. Fox & Co.	Soerabaya	New York	9,180	
L. Littlejohn & Co., Inc.	Soerabaya	New York	303,300	
L. Littlejohn & Co., Inc.	Singapore	New York	951,300	
Firestone Tire & Rubber Co.	Singapore	Akron	448,020	
Baring Brothers	Singapore	New York	312,660	
William H. Stiles & Co.	Singapore	New York	78,400	
Alden's Successors, Inc.	Singapore	New York	115,020	
Jaeger & Co.	Singapore	New York	20,160	
H. A. Astlett & Co.	Singapore	New York	120,000	
The Fisk Rubber Co.	Singapore	Chicopee Falls	112,000	
Various	Singapore	New York	43,220	
H. Muehlstein & Co.	Belawan-Deli	New York	132,840	
General Rubber Co.	Belawan-Deli	New York	491,400	
Various	Batavia	New York	369,180	
Various	Colombo	New York	1,053,720	
Various	Belawan-Deli	New York	90,180	
Schafer & Meyer	Soerabaya	New York	17,432	
Various	Soerabaya	New York	79,408	5,252,680

	Shipment from:	Shipped to:	Pounds	Totals
JANUARY 16. By the S. S. "Noordam" at New York.				
Various	Rotterdam	New York	340,820	340,820
JANUARY 16. By the S. S. "Lorenzo" at New York.				
Pacific Trading Corporation of America	Colombo	New York	65,520	
Goldman Sachs & Co.	Colombo	New York	12,600	
Thomas A. Desmond & Co.	Colombo	New York	1,440	
Oliver Keller & Sandler.	Colombo	New York	360	
Jaeger & Co.	Colombo	New York	31,320	
Various	Colombo	New York	383,280	
The Fisk Rubber Co.	Singapore	Chicopee Falls	33,600	528,120
JANUARY 18. By the S. S. "Media" at New York.				
Various	Liverpool	New York	330,300	330,300
JANUARY 20. By the S. S. "Valacia" at New York.				
Poel & Kelly, Inc.	London	New York	2,400	
L. Littlejohn & Co., Inc.	London	New York	1,092,120	
Fred Stern & Co.	London	New York	11,200	1,105,720
JANUARY 20. By the S. S. "Cedric" at New York.				
Various	Liverpool	New York	45,000	45,000
JANUARY 20. By the S. S. "Tydeus" at Boston.				
Hood Rubber Co.	Singapore	Watertown	154,800	154,800
JANUARY 20. By the S. S. "Tydeus" at New York.				
Firestone Tire & Rubber Co.	Singapore	Akron	639,720	
Pennsylvania Rubber Co. of America	Singapore	Jeannette	170,280	
W. T. Sargent & Co.	Singapore	New York	184,860	
Baird Rubber & Trading Co., Inc.	Singapore	New York	246,400	
Poel & Kelly, Inc.	Singapore	New York	1,083,380	
East Asiatic Co., Inc.	Singapore	New York	244,080	
General Rubber Co.	Singapore	New York	459,200	
L. Littlejohn & Co., Inc.	Singapore	New York	1,030,400	
Fred Stern & Co.	Singapore	New York	432,000	
F. R. Henderson & Co., Inc.	Singapore	New York	805,700	
H. A. Astlett & Co.	Singapore	New York	11,200	
William H. Stiles & Co.	Singapore	New York	112,000	
Chas. T. Wilson Co., Inc.	Singapore	New York	241,920	
Schafer & Meyer	Singapore	New York	56,000	
Hood Rubber Co.	Singapore	Watertown	89,576	
Various	Singapore	New York	114,604	
Various	Pt. Swettenham	New York	242,640	
Various	Belawan-Deli	New York	990,540	
Various	Telok Neboeng	New York	128,700	
Various	Penang	New York	391,140	
General Rubber Co.	Colombo	New York	134,400	
Various	Colombo	New York	348,360	8,157,100
JANUARY 24. By the S. S. "Montauk" at New York.				
General Rubber Co.	London	New York	112,000	
Fred Stern & Co.	London	New York	51,840	
Continental Rubber Co., Inc.	London	New York	56,000	
L. Littlejohn & Co., Inc.	London	New York	12,165	
William H. Stiles & Co.	London	New York	22,400	254,405
JANUARY 26. By the S. S. "Panhandle State" at New York.				
F. R. Henderson & Co., Inc.	London	New York	495,000	
Various	London	New York	1,445,040	1,940,040
JANUARY 26. By the S. S. "Westerdyk" at New York.				
Thornett & Fehr, Inc.	Rotterdam	New York	38,340	
Various	Rotterdam	New York	250,200	
L. Littlejohn & Co., Inc.	London	New York	179,200	467,740
FEBRUARY 1. By the S. S. "Clan McBride" at New York.				
F. R. Henderson & Co., Inc.	Singapore	New York	67,200	
H. A. Astlett & Co.	Singapore	New York	25,000	92,200
FEBRUARY 1. By the S. S. "Wray Castle" at New York.				
Poel & Kelly, Inc.	Singapore	New York	372,960	
General Rubber Co.	Singapore	New York	346,960	
Pennsylvania Rubber Co.	Singapore	New York	50,400	
Firestone Tire & Rubber Co.	Singapore	New York	448,020	
L. Littlejohn & Co., Inc.	Penang	New York	1,176,000	
Baird Rubber & Trading Co., Inc.	Penang	New York	89,600	
William H. Stiles & Co.	Penang	New York	344,960	
Baring Bros.	Singapore	New York	54,000	
Fred Stern & Co.	Singapore	New York	367,628	
Meyer & Brown, Inc.	Singapore	New York	119,700	
Schafer & Meyer	Singapore	New York	45,000	
H. Muehlstein & Co.	Singapore	New York	18,900	
Chas. T. Wilson Co., Inc.	Singapore	New York	123,200	
Alden's Successors, Inc.	Singapore	New York	287,840	
Thornett & Fehr	Singapore	New York	87,480	
Continental Rubber Co. of New York	Singapore	New York	44,800	
Ajax Rubber Co., Inc.	Singapore	New York	12,420	
Phelan, Berland & Fear	Singapore	New York	73,620	

Totals

Plantations—Continued

	Shipment from:	Shipped to:	Pounds	Totals	Shipment from:	Shipped to:	Pounds	Totals
340,820	American Trading Corporation	Singapore	New York	40,320	FEBRUARY 7. By the S. L. Littlejohn & Co., Inc.	S. "Vechtdyk" at New York.	110,725	110,725
	Pacific Trading Corporation	Singapore	New York	144,360	FEBRUARY 9. By the S. General Rubber Co., Inc.	S. "City of Adelaide," at New York.	772,800	
	W. R. Grace & Corporation	Singapore	New York	61,200	Poel & Kelly, Inc.	Singapore	New York	832,090
	F. R. Henderson & Co., Inc.	Singapore	New York	315,500	Baird Rubber & Trading Co., Inc.	Singapore	New York	548,800
	Hood Rubber Co.	Singapore	Watertown	33,382	Continental Rubber Co. of New York	Singapore	New York	44,800
	J. T. Johnstone Co., Inc.	Malacca	New York	143,059	Fred Stern & Co.	Singapore	New York	164,188
	Various	Singapore	New York	68,218	F. R. Henderson & Co., Inc.	Singapore	New York	245,400
528,120	Schafer & Meyer	Singapore	New York	56,000	H. A. Astlett & Co.	Singapore	New York	258,000
	Meyer & Brown	Singapore	New York	134,400	The Fisk Rubber Co.	Singapore	Chicopee Falls	112,000
	Various	Malacca	New York	885,881	Nat. E. Bergen	Singapore	New York	65,520
330,300	Various	Medan	New York	55,980	Raw Products Co.	Singapore	New York	99,000
	Various	Colombo	New York	154,800	Chas. T. Wilson Co.	Singapore	New York	89,600
	F. R. Henderson & Co., Inc.	Malacca	New York	926,000	H. Muehlstein & Co.	Singapore	New York	97,920
	FEBRUARY 2. By the S. Firestone Tire & Rubber Co.	S. "Grace Dollar" at New York.			Irwin-Harrisons Crosfield, Inc.	Singapore	New York	29,700
105,720	Fred Stern & Co.	Singapore	New York	118,620	Hood Rubber Co.	Singapore	Watertown	51,150
45,000	H. Muehlstein & Co.	Singapore	New York	387,494	Habicht & Co.	Singapore	New York	144,000
	L. Littlejohn & Co.	Singapore	New York	135,000	Wm. H. Stiles & Co.	Singapore	New York	490,560
154,800	Wm. H. Stiles & Co.	Singapore	New York	876,240	Williams Shipping Agency	Singapore	New York	655,920
	Baird Rubber & Trading Co., Inc.	Singapore	New York	168,000	Phelan, Borland & Fearns	Singapore	New York	28,800
	Chas. T. Wilson Co., Inc.	Singapore	New York	109,760	Thornett & Fehr	Singapore	New York	93,960
	Phelan, Borland & Fearns	Singapore	New York	199,360	Firestone Tire & Rubber Co.	Singapore	New York	784,800
	Various	Singapore	New York	39,280	Meyer & Brown, Inc.	Singapore	New York	56,000
	American Trading Co.	Singapore	New York	80,460	L. Littlejohn & Co., Inc.	Far East	New York	1,075,200
	Poel & Kelly, Inc.	Singapore	New York	164,700	Aldens' Successors, Inc.	Colombo	New York	25,760
	H. A. Astlett & Co.	Singapore	New York	45,000	Various	Malacca	New York	151,560
	F. R. Henderson & Co., Inc.	Singapore	New York	40,700	Irwin-Harrisons Crosfield, Inc.	Penang	New York	30,240
	General Rubber Co.	Singapore	New York	800,720	Various	Penang	New York	989,240
	H. Muehlstein & Co.	Belawan	New York	80,640	Various	Belawan-Deli	New York	902,520
	Irwin-Harrisons Crosfield, Inc.	Belawan	New York	37,980	Irwin-Harrisons Crosfield, Inc.	Pt. Swet'n'm	New York	85,860
	Various	Belawan	New York	1,386,180	Various	Pt. Swet'n'm	New York	2,160
	W. R. Grace & Co.	Colombo	New York	318,860	Various	Maur	New York	18,000
	Poel & Kelly, Inc.	Colombo	New York	65,160	Various	Teluk Anson	New York	62,280
	Various	Pt. Swettenham	New York	8,640	Various	Port Dickson	New York	5,400
	FEBRUARY 3. By the S. Chas. T. Wilson Co., Inc.	S. "City of Lahore" at New York.			FEBRUARY 10. By the S. Poel & Kelly, Inc.	S. "Rangoon Maru" at New York.	90,650	
	General Rubber Co.	Colombo	New York	56,000	F. R. Henderson & Co., Inc.	Singapore	New York	207,472
	Poel & Kelly, Inc.	Colombo	New York	150,080	Various	Singapore	New York	820,218
	Baird Rubber & Trading Co., Inc.	Colombo	New York	2,300	Fred Stern & Co.	Soerabaya	New York	12,617
	Fred Stern & Co.	Colombo	New York	22,400	Various	Soerabaya	New York	318,403
	F. R. Henderson & Co., Inc.	Colombo	New York	11,200	L. Littlejohn & Co., Inc.	Far East	New York	470,400
	H. A. Astlett & Co.	Colombo	New York	122,040	F. R. Henderson & Co., Inc.	Malacca	New York	371,228
	L. Littlejohn & Co.	Colombo	New York	22,400	Various	Batavia	New York	240,660
	L. Littlejohn & Co.	Far East	New York	156,800	FEBRUARY 10. By the S. General Rubber Co.	S. "Mesaba" at New York.	60,000	
	FEBRUARY 3. By the S. L. Littlejohn & Co., Inc.	S. "Menominee" at New York.			L. Littlejohn & Co., Inc.	London	New York	560,000
7,100	L. Littlejohn & Co., Inc.	London	New York	224,000	Fred Stern & Co.	London	New York	11,200
	FEBRUARY 3. By the S. Hood Rubber Co.	S. "City of Lahore" at Boston.			Michelin Tire Co.	London	New York	48,060
	Hood Rubber Co.	Ceylon	Watertown	78,540	FEBRUARY 10. By the S. Continental Rubber Co. of New York	S. "Pannonia" at New York.		
	FEBRUARY 4. By the S. Schafer & Meyer	S. "Kansas," at New York.			L. Littlejohn & Co., Inc.	London	New York	22,400
4,405	Baird Rubber & Trading Co.	Singapore	New York	20,160	Fred Stern & Co.	London	New York	672,000
	Fred Stern & Co.	Singapore	New York	179,200	The Fisk Rubber Co.	London	Chicopee Falls	112,289
	F. R. Henderson & Co., Inc.	Singapore	New York	117,096	Meyer & Brown, Inc.	London	New York	10,080
	H. A. Astlett & Co.	Singapore	New York	330,500	Various	London	New York	1,021,263
0,040	The Fisk Rubber Co.	Singapore	New York	22,400	FEBRUARY 12. By the S. Poel & Kelly, Inc.	S. "Biyo Maru" at New York.		
	Poel & Kelly, Inc.	Singapore	Chicopee Falls	356,980	Meyer & Brown, Inc.	Soerabaya	New York	299,880
	General Rubber Co.	Singapore	New York	237,440	Schafer & Meyer	Penang	New York	100,800
7,740	Chas. T. Wilson Co.	Singapore	New York	459,200	L. Littlejohn & Co., Inc.	Colombo	New York	194,800
	W. H. Stiles & Co.	Singapore	New York	67,200	Schafer & Meyer	Singapore	New York	94,260
	Hood Rubber Co.	Singapore	Watertown	11,200	The Fisk Rubber Co.	Singapore	Chicopee Falls	22,400
	L. Littlejohn & Co., Inc.	Far East	New York	1,120,000	Fred Stern & Co.	Batavia	New York	55,879
2,200	Meyer & Brown, Inc.	Medan	New York	322,560	F. R. Henderson & Co., Inc.	Batavia	New York	112,000
	Schafer & Meyer	Penang	New York	12,960	Aldens' Successors, Inc.	Batavia	New York	29,120
	Various	Penang	New York	22,400	Various	Batavia	New York	579,581
	Various	Teluk Anson	New York	464,860	Various	Belawan-Deli	New York	408,678
	Various	Belawan-Deli	New York	32,220	FEBRUARY 13. By the S. Hood Rubber Co.	S. "Kandahar" at Boston.		
	Various	Belawan-Deli	New York	292,320	FEBRUARY 13. By the S. Fred Stern & Co.	S. "Nieuw Amsterdam" at New York.	134,500	134,500
	FEBRUARY 5. By the S. Baird Rubber & Trading Co., Inc.	S. "Finland" at New York.			Thornett & Fehr, Inc.	Rotterdam	New York	6,647
	Baird Rubber & Trading Co., Inc.	Antwerp	New York	19,900	FEBRUARY 13. By the S. L. Littlejohn & Co., Inc.	S. "Virgilia" at New York.	201,600	
	L. Littlejohn & Co., Inc.	London	New York	123,482	Henderson, Forbes & Co.	London	New York	62,380
	Aldens' Successors, Inc.	London	New York	302,400	FEBRUARY 14. By the S. F. R. Henderson & Co., Inc.	S. "Centennial State" at New York.		
	Various	London	New York	37,318	Various	London	New York	38,080
	FEBRUARY 7. By the S. Poel & Kelly, Inc.	S. "Shunko Maru" at New York.			Various	London	New York	1,226,780
	Baird Rubber & Trading Co., Inc.	Singapore	New York	377,500	FEBRUARY 14. By the S. L. Littlejohn & Co., Inc.	S. "Cragness" at New York.	481,600	
	Fred Stern & Co.	Singapore	New York	100,800	F. R. Henderson & Co., Inc.	London	New York	1,066,860
	Thornett & Fehr	Singapore	New York	201,742	Various	Liverpool	New York	804,240
	Baring Bros.	Singapore	New York	360,540	FEBRUARY 14. By the S. Poel & Kelly, Inc.	S. "Satartia" at New York.	57,900	
	H. Muehlstein & Co.	Singapore	New York	20,160	F. R. Henderson & Co., Inc.	Colombo	New York	154,200
	W. R. Grace	Singapore	New York	82,800	The Goodyear Tire & Rubber Co.	Colombo	New York	117,000
	Hood Rubber Co.	Singapore	New York	192,240	Various	Colombo	New York	361,980
	Schafer & Meyer	Singapore	New York	55,860	L. Littlejohn & Co., Inc.	Far East	New York	67,200
	Meyer & Brown, Inc.	Singapore	New York	78,400	Wm. H. Stiles & Co.	Singapore	New York	11,200
	L. Littlejohn & Co., Inc.	Far East	New York	89,600	FEBRUARY 15. By the S. L. Littlejohn & Co., Inc.	S. "Ferbania" at New York.	694,400	694,400
		Far East	New York	280,000				

Plantations—Continued

	Shipment from:	Shipped to:	Pounds	Totals
FEBRUARY 16.	By the S. S. "Madawaska" at New York.			
Meyer & Brown, Inc.,	Colombo	New York	156,800	156,800
FEBRUARY 16.	By the S. S. "Sanuki Maru" at New York.			
Meyer & Brown, Inc.,	Colombo	New York	425,600	425,600
FEBRUARY 24.	By the S. S. "Bowes Castle" at New York.			
Meyer & Brown, Inc.,	Far East	New York	22,400	22,400

Centrals

JANUARY 14.	By the S. S. "General Ott Ernst" at New York.			
Public, Calvet & Co.,	Cristobal	New York	29,250	29,250
JANUARY 27.	By the S. S. "Tosto" at New York.			
Mecke & Co.,	Cartagena	New York	4,250	4,250
JANUARY 28.	By the S. S. "Colon" at New York.			
W. R. Grace & Co.,	Cristobal	New York	1,950	1,950
FEBRUARY 1.	By the S. S. "Elbro" at New York.			
G. Amsinck & Co., Inc.,	Valparaiso	New York	4,650	4,650
FEBRUARY 5.	By the S. S. "Allianza" at New York.			
G. Amsinck & Co., Inc.,	Cristobal	New York	1,200	1,200

Africans

JANUARY 16.	By the S. S. "Pipestone County" at New York.			
Peel & Kelly, Inc.,	Bordeaux	New York	210,950	210,950
JANUARY 17.	By the S. S. "New Britain" at New York.			
Various	Antwerp	New York	83,430	83,430
FEBRUARY 6.	By the S. S. "Finland" at New York.			
Baird Rubber & Trading Co., Inc.,	Antwerp	New York	101,315	101,315
FEBRUARY 11.	By the S. S. "Western Plains" at Boston.			
Hood Rubber Co.,	Antwerp	Watertown	73,269	73,269

Pontianak

JANUARY 15.	By the S. S. "West Canon" at New York.			
W. Ross & Co.,	Singapore	New York	2,400	2,400
FEBRUARY 2.	By the S. S. "Wray Castle" at New York.			
L. Littlejohn & Co., Inc.,	Singapore	New York	119,400	119,400
FEBRUARY 2.	By the S. S. "Grace Dollar" at New York.			
Various	Shanghai	New York	163,500	163,500
FEBRUARY 7.	By the S. S. "Shunko Maru" at New York.			
Various	Singapore	New York	119,100	119,100
FEBRUARY 10.	By the S. S. "Rangon Maru" at New York.			
Various	Singapore	New York	33,000	33,000

Balata

JANUARY 21.	By the S. S. "Panama" at New York.			
Uhrmann Corporation,	Cristobal	New York	3,300	3,300
JANUARY 22.	By the S. S. "Commewijne" at New York.			
William Schall & Co.,	Port au Prince	New York	3,600	3,600
JANUARY 32.	By the S. S. "Maraval" at New York.			
South & Central America Commercial Co.,	Trinidad	New York	11,730	
Booth & Co.,	Trinidad	New York	11,730	23,460
FEBRUARY 5.	By the S. S. "Matura" at New York.			
Various	Trinidad	New York	7,200	7,200
FEBRUARY 12.	By the S. S. "Guiana" at New York.			
Various	Br. W. Indies	New York	24,240	24,240

Custom House Statistics

New York

Imports

	December			
	1920		1921	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—free				
Crude rubber				
From Belgium	13,650	\$2,048	495,005	\$55,502
France	22,469	8,825	484,906	52,705
Netherlands	211,832	90,525	2,599,485	551,453
England	398,403	98,312	6,278,293	1,009,332
Nicaragua	1,013	152		
Panama	130	32		
Brazil	1,533,355	297,574	1,612,303	234,951
Colombia	7,518	2,403	2,593	766
Ecuador	4,800	1,495	32,110	11,850
British Guiana	137,138	28,133	5,280	3,064
Peru	96,534	35,866		
Uruguay				
Venezuela			11,237	6,170
British India	253,470	89,677	47,793	5,346
Straits Settlements	15,460,373	4,938,588	23,806,202	3,026,833
British East Indies	3,067,478	738,292	6,170,677	861,028
Dutch East Indies	1,828,966	585,100	12,909,028	2,123,714
Hongkong			152,320	30,464
Japan			22,400	3,808
Philippine Islands	41,060	10,150		
Far East Republic			1,722,437	120,612
Totals	23,078,189	\$6,927,172	56,352,069	\$8,097,598
Balata	50,212	31,404	258,083	153,162
Jelutong (Pontianak)			1,487,452	129,731
Gutta percha	116,441	29,380	362,340	47,459
Totals	23,244,842	\$6,987,956	58,459,944	\$8,427,950
Rubber scrap and reclaimed	390,996	46,765	401,909	32,842
Totals, unmanufactured	23,635,838	\$7,034,721	58,861,853	\$8,460,792
Manufactures of rubber and gutta percha, dutiable		\$31,005		\$96,931
Chicle, dutiable	583,479	352,254	131,404	61,368
Rubber substitutes, dutiable			6,760	676

Exports

	December			
	1920		1921	
	Pounds	Value	Pounds	Value
MANUFACTURED				
Automobile and other tires		\$2,984,520		\$1,022,133
Inner tubes		243,232		73,931
Belting, hose, and packing		810,053		124,074
Rubber boots and shoes, pairs	746,300	836,501	114,912	105,978
Soles and heels		73,826		18,469
Druggists' sundries		143,433		32,404
Other rubber manufactures		587,641		192,408
Totals, manufactured		\$5,679,206		\$1,569,397
Insulated wire		\$1,168,329		\$310,582
UNMANUFACTURED—free				
Rubber scrap and reclaimed	672,869	\$48,403	752,392	\$48,481

Foreign Exports

Crude rubber	343,216	\$91,602	27,974	\$17,410
Balata	52,059	34,807	41,140	23,270
Chicle	4,392	1,899	2	3
Rubber manufactures		4,344		1,855
Rubber substitutes	86,183	9,742	1,699	2,000

Buffalo
Imports

UNMANUFACTURED—free				
Crude rubber				
From Canada	209	\$209	325	\$83
Rubber scrap and reclaimed	32,165	1,654	44,027	1,609
Totals, unmanufactured	32,374	\$1,863	44,352	\$1,692
Rubber manufactures, dutiable		\$9,477		\$21,307

Exports

MANUFACTURED				
Automobile and other tires		\$260,344		\$44,080
Inner tubes		77,760		6,386
Belting, hose, and packing		15,706		12,662
Rubber boots and shoes, pairs	934	2,613	224	706
Soles and heels				206
Druggists' sundries		13,097		5,846
Other rubber manufactures		9,477		61,156
Totals, manufactured	934	\$378,997	224	\$131,042
Insulated wire		7,529		6,935
Rubber scrap and reclaimed	149,535	21,876	47,321	4,865

Foreign Exports

Crude rubber	983,223	\$174,058	1,068,880	\$203,255
Rubber manufactures		1,680		

Chicago
Imports

Rubber scrap and reclaimed	28,500	\$998	3,094	\$28
Rubber manufactures, dutiable		825		4,977
Chicle	638,976	324,396	305,240	121,050

Massachusetts

Imports

UNMANUFACTURED—free				
Crude rubber				
From Straits Settlements	4,600	\$1,130	372,060	\$42,563
British East Indies	273,400	55,108	371,040	42,753
Totals, unmanufactured	278,000	\$56,238	743,100	\$85,316
Rubber manufactures, dutiable		4,397		80

Exports

MANUFACTURED				
Automobile and other tires				\$1,016
Inner tubes				21
Belting		\$21		
Hose		3,728		5,599
Packing		11		
Rubber boots	3,910	11,357	5,254	12,648
Rubber shoes	63,399	70,443	11,492	7,029
Soles and heels		4,226		4,572
Druggists' sundries		2,042		3,472
Other rubber manufactures		29,074		50,808
Totals, manufactured		\$120,902		\$85,165
Insulated wire		192		12,269

Ohio

Imports

Rubber manufactures, dutiable		\$247		\$15,103
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Exports

MANUFACTURED				
Automobile and other tires				\$61,436
Other rubber manufactures				56
Totals, manufactured				\$61,492

Custom House Statistics—Continued

Michigan				
Imports				
December				
	1920		1921	
	Pounds	Value	Pounds	Value
Rubber scrap and reclaimed	3,800	\$15	62,000	\$596
Rubber manufactures, dutiable		1,851		
Exports				
MANUFACTURED				
Automobile and other tires..				\$1,464
Inner tubes				
Belting, hose, and packing..				1,096
Rubber boots and shoes, pairs			180	628
Soles and heels.....				
Druggists' sundries.....				167
Other rubber manufactures..				1,507
Totals, manufactured...			180	\$4,862
Insulated wire		\$6,447		1,253
Rubber scrap and reclaimed			37,026	509

New Orleans				
Imports				
UNMANUFACTURED—free				
Crude rubber				
From Costa Rica.....	957	\$89		
Exports				
MANUFACTURED				
Automobile and other tires..		\$21,144		\$8,464
Inner tubes		2,783		2,026
Belting, hose, and packing..		24,452		8,712
Rubber boots and shoes, pairs	36,674	45,068	6,361	7,500
Soles and heels.....		43		126
Druggists' sundries.....		2,247		307
Other rubber manufactures..		5,061		1,036
Totals, manufactured...		\$100,798		
Insulated wire		6,612		\$2,041

San Francisco				
Imports				
UNMANUFACTURED—free				
Crude rubber				
From Straits Settlements..	89,310	\$20,603	170,240	\$24,730
Colombia	3,300	800		
Dutch East Indies.....			45,921	5,865
Totals	92,510	\$21,403	216,161	\$30,595
Gutta percha			21,280	2,170
Balata	463	185		
Chicle	28,276	15,608		
Rubber manufactures, dutiable		119		486
Exports				
MANUFACTURED				
Automobile and other tires..		\$80,831		\$64,167
Inner tubes		18,809		4,467
Belting, hose, and packing..		121,293		25,155
Rubber boots and shoes, pairs	1,368	1,583	1,349	1,943
Soles and heels.....		5,404		338
Druggists' sundries.....		2,782		5,439
Other rubber manufactures..		7,388		2,647
Totals, manufactured...		\$238,090		\$104,156
Insulated wire		10,274		633
Rubber scrap and reclaimed.	60,430	604		

Washington				
Imports				
UNMANUFACTURED—free				
Crude rubber				
Rubber scrap and reclaimed.	625	\$125		
MANUFACTURED				
Rubber manufactures, dutiable		30		
Exports				
UNMANUFACTURED—free				
Crude rubber	20,112	4,517		
MANUFACTURED				
Automobile and other tires..		\$4,804		\$13,450
Inner tubes				935
Belting, hose, and packing..		549		1,469
Rubber boots and shoes, pairs	1,112	3,521	897	1,332
Druggists' sundries.....		67		232
Other rubber manufactures..		1,455		1,068
Totals, manufactured...		\$10,396		\$18,486
Insulated wire		924		376
Rubber scrap and reclaimed.	11,878	291	187	4

Philadelphia

Imports				
December				
	1920		1921	
	Pounds	Value	Pounds	Value
Rubber manufactures.....		\$55		\$601
Exports				
MANUFACTURED				
Automobile and other tires..		\$143		
Belting, hose, and packing..		19,735		\$4,820
Totals, manufactured...		\$19,878		\$4,820
Rubber scrap			56,723	3,295

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber				
November				
	1920		1921	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—free				
Rubber, gutta percha, etc.				
From United Kingdom....	4,480	\$2,088	98,430	\$16,663
United States.....	592,385	125,934	1,657,511	259,835
Belgium	4,497	1,860		
Brazil	22,000	7,269		7,514
British East Indies..				
India			11,200	1,690
Straits Settlements..	528,658	226,966		63
Total	1,152,020	\$364,117	1,767,141	\$285,765
Balata	28	51		
Rubber, recovered.....	124,509	22,585	176,711	16,398
Rubber, powdered, and rubber				
or gutta percha scrap.....	142,396	10,192	121,880	9,398
Rubber substitutes	170,065	18,977	51,075	6,277
Totals, unmanufactured..	1,589,018	\$415,922	2,116,807	\$317,838
PARTLY MANUFACTURED				
Hard rubber sheets and rods.	95,109	\$51,857	211	\$456
Hard rubber tubes.....		4,374		1,032
Rubber thread, not covered..	785	1,168	6,852	8,727
Totals, partly manufactured	95,894	\$57,399	7,063	\$10,215
MANUFACTURED				
Belting		\$24,244		\$5,485
Hose		17,003		4,901
Packing		6,338		5,321
Boots and shoes.....		36,313		8,912
Clothing, including water-				
proofed		22,885		15,124
Gloves		1,358		1,277
Hot-water bottles		2,984		1,812
Tires, solid		10,906		11,096
Tires, pneumatic		236,564		19,337
Inner tubes		28,068		6,670
Elastic, round or flat.....		31,993		28,292
Mats and matting.....		338		440
Cement		3,353		2,075
Other rubber manufactures..		120,179		77,132
Totals, manufactured...		\$542,526		\$187,874
Totals, rubber imports...	1,684,912	\$1,015,847	2,123,870	\$515,927
Insulated wire and cables				
Wire and cables covered with				
cotton, linen, silk, rubber,				
etc.		\$17,641		\$3,794
Copper wire and cables, covered				
as above.....		24,222		9,996
Chicle	510	230	85,586	52,055
Webbing		27,515		42,499
Fountain pens		8,173		6,189

Exports of Domestic and Foreign Rubber Goods

November				
	1920		1921	
	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED				
Crude and waste rubber.....	\$2,574		\$3,506	\$628
MANUFACTURED				
Belting	\$9,791		\$1,515	
Hose	27,271		12,534	
Boots and shoes.....	206,426	\$491	61,963	341
Clothing, including water-				
proofed	3,808		1,428	322
Tires, pneumatic	851,561		223,163	
Tires	8,804	930	12,434	2,320
Other manufactures.....	54,574	5,370	24,750	5,419
Totals, manufactured...	\$1,162,235	\$6,791	\$337,787	\$8,602
Totals, rubber exports...	\$1,164,809	\$6,791	\$341,293	\$9,230

Exports of India Rubber Manufactures and Insulated Wire and Cable from the United States by Countries During the Month of December, 1921

EXPORTED TO—	Riding Value	Hose Value	Packings Value	Boots		Shoes		Soles and Heels Value	Automobile Tires		Druggists' Rubber Shoes Value	All Other Manufactures of Rubber Value	Totals Value	Insulated Wire and Cable Value
				Pairs	Value	Pairs	Value		Inner Tubes Value	Solid Value				
EUROPE														
Azores, etc., Islands.
Belgium	\$286	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Denmark	\$335	936	\$1,147	64	\$46	.....	.....	.....	.....	.....	.....	.....
Finland	2,319	3,922	.....	.....	.....	.....	.....	.....	.....
France	2,074	182	.....	.....	94	114	.....	.....	.....	.....	.....	.....	.....
Germany
Greece
Iceland, etc., Island
Italy	2	13	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jugoslavia, etc.
Latvia
Lithuania
Natal, etc., Islands.
Netherlands	1,022	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norway	73	48	60	.....	.....	.....	.....	.....	.....	.....	.....	.....
Poland and Danzig
Portugal
Spain	170	36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sweden	2,257	662	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Switzerland	48	117	.....	.....	.....	.....	.....	.....	.....	.....	.....
England	11,557	3,886	3,874	8,075	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scotland	107	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ireland
TOTALS, EUROPE	\$17,360	\$5,201	4,908	\$9,412	34,211	\$40,557	\$1,136	\$172,882	\$9,387	\$182	\$166,853	\$690,539	\$123,091
NORTH AMERICA														
Bermuda	\$26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British Honduras	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canada	8,903	7,869	993	\$4,257	.....	.....	.....	.....	.....	.....	.....	.....	.....
Costa Rica	1,425	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cuba
Guatemala	210	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Haiti
Nicaragua	1,939	137	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Panama	296	383	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salvador	40	390	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mexico	22,708	9,609	303	454	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miquelon, Langley, etc.	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newfoundland and Labrador	182	.....	1,902	5,918	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barbados
Trinidad and Tobago	193	171	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other British West Indies	1,657	597	6	23	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cuba	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Virgin Islands of United States	639	1,806	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dutch West Indies	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
French West Indies	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Haiti	364	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dominican Republic	258	504	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, NORTH AMERICA	\$42,623	\$22,401	3,304	\$10,622	40,901	\$38,817	\$17,433	\$251,384	\$28,301	\$3,825	\$169,675	\$671,800	\$94,431
SOUTH AMERICA														
Argentina	\$610	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bolivia	1,325	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brazil	4,217	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chile	2,338	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colombia	657	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ecuador	23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru
Uruguay
Venezuela	274	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, SOUTH AMERICA	\$11,148	\$567	132	\$970	48,805	\$39,159	\$5,112	\$215,835	\$6,785	\$1,818	\$11,611	\$322,089	\$52,972
OCEANIA														
Australia
New Zealand
Other British Oceania
French Oceania
Other Oceania
Philippine Islands
TOTALS, OCEANIA	\$1,818	1,177	12	21	35,897	25,633	\$2,065	\$131,373	\$22,456	\$1,877	\$24,611	\$232,732	\$11, '63
TOTALS	\$3,118	\$3,977	60	\$398	37,686	\$27,611	\$2,065	\$131,373	\$22,456	\$1,877	\$24,611	\$232,732	\$11, '63

TOTALS, OCEANIA..... \$4,895
 \$3,118
 \$3,077
 60
 \$398
 37,686
 \$27,611
 \$2,065
 \$131,373
 \$8,956
 \$22,456
 \$1,395
 \$1,877
 \$24,611
 \$232,732
 \$13, '63

	Boots		Shoes		Packing		Hose		Belting		Automobile Tires		Sole and Heels		Casings		Inner Tubes		Solid Tires		All Other Values		Druggists' Sundries		All Other Manufacturers of Rubber		Totals Value		Insulated Wire and Cables	
	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value
Asia																														
China																														
Kwantung, etc.		\$1,266		444		\$411																								
Hosen		66																												
India		80		360		341																								
British East Indies		4,835		1,771		2,671																								
Other British East Indies		8		96		89																								
Dutch East Indies		5		44		153																								
French Indo China																														
Hejaz, etc.																														
Hongkong																														
Japan		3,026		1,368		1,273																								
Palestine and Syria		212		10,642		11,268																								
Russia in Asia																														
Sum																														
TOTALS, ASIA	284	\$748	14,725	\$16,206																										
AFRICA																														
Belgian Congo																														
British West Africa		\$184																												
British South Africa																														
British East Africa		6,064		216		\$172																								
Canary Islands																														
Portuguese Africa																														
EGYPT																														
TOTALS, AFRICA	72	\$280	216	\$172																										
GRAND TOTALS	8,660	\$4,056	43,854	\$43,854																										

Exports of Rubber Goods to Non-Contiguous Territories of the United States

	Boots and Shoes		Automobile Tires		All Other Values		Druggists' Sundries		All Other Manufacturers of Rubber		Totals Value		Insulated Wire and Cables	
	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value	Pairs	Value
Hawaii														
Porto Rico														
TOTALS														

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	December		December	
	1920	1921	1920	1921
	Pounds	Value	Pounds	Value
UNMANUFACTURED—free				
India rubber				
From France	22,469	\$8,825	484,906	\$52,705
Netherlands	211,832	90,525	2,599,485	551,453
United Kingdom	398,403	98,312	6,278,293	1,009,332
Canada	209	209	325	83
Central America	2,275	373		
Brazil	1,533,355	297,574	1,612,303	234,951
Peru	137,138	28,133		
Other South America	112,052	40,564	51,220	21,850
British East Indies	19,249,506	5,895,233	32,260,048	4,158,511
Dutch East Indies	1,828,966	585,100	12,954,949	2,129,579
Other countries	665,556	269,790	2,403,292	211,880
Totals	24,161,761	\$7,314,638	58,644,821	\$8,370,344
Balata	50,675	31,589	258,083	153,162
Jelutong (Pontianak)			1,487,452	129,731
Gutta percha	116,441	29,380	383,620	49,629
Rubber scrap	468,040	49,985	696,501	40,074
Totals, unmanufactured	24,796,917	\$7,425,592	61,470,477	\$8,742,940
Chicle	1,250,881	\$692,338	436,644	\$182,918
MANUFACTURED—dutiable				
India rubber and gutta percha		\$53,656		\$145,150
India rubber substitutes			6,760	676

Exports of Domestic Merchandise

MANUFACTURED		MANUFACTURED	
India rubber		India rubber	
Scrap and old	785,279	\$51,380	952,511
Reclaimed	220,177	32,407	82,664
Belting		491,525	71,328
Hose		443,610	89,995
Packing		164,613	43,854
Boots		38,799	22,430
Shoes		950,304	152,522
Soles and heels		85,918	26,350
Tires			
Casings		3,264,711	1,193,160
Inner tubes		366,468	98,553
Solid tires		244,527	99,912
All other tires		30,945	7,549
Druggists' rubber sundries		182,898	65,161
Other rubber manufactures		743,977	402,122
Suspenders and garters		364,406	53,380
Totals, manufactured		\$7,456,488	\$2,389,236
Fountain pens	56,305	\$67,361	6,721
Insulated wire and cables		1,301,307	362,899

Exports of Foreign Merchandise

UNMANUFACTURED		UNMANUFACTURED	
India rubber		India rubber	
Balata	1,616,486	\$280,868	1,322,366
	52,059	34,807	47,908
Totals, unmanufactured	1,668,545	\$315,675	1,370,274
MANUFACTURED			
Gutta percha and india rubber		\$6,048	\$1,855
India rubber substitutes		1,699	2,000
Totals, manufactured		\$7,747	\$3,855

Exports of Rubber Goods to Non-Contiguous Territories of the United States

MANUFACTURED		MANUFACTURED	
To Alaska		To Alaska	
Belting, hose, and packing		\$14,326	\$4,783
Boots and shoes	2,216	6,241	17,487
Other rubber goods		1,996	4,132
Totals		\$22,563	\$26,402
To Hawaii			
Belting, hose, and packing		\$25,510	\$7,966
Automobile tires		60,335	131,175
Other tires		1,856	389
Other rubber goods		15,634	23,190
Totals		\$103,325	\$162,720
To Porto Rico			
Belting, hose, and packing		\$13,045	\$2,601
Automobile tires		165,862	85,681
Other tires		1,026	3,903
Other rubber goods		85,373	36,480
Totals		\$265,306	\$128,665

Details of exports of domestic merchandise by countries during December, 1921, appear on this and the preceding page.

United Kingdom Rubber Statistics

	Imports			
	December			
	1920	1921	1920	1921
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude rubber				
From—				
Straits Settlements	5,324,500	£287,453	1,885,900	£84,836
Federated Malay States	3,335,100	191,921	4,498,000	213,724
British India	892,500	53,132	219,900	10,610
Ceylon and dependencies	4,135,400	233,547	3,008,400	138,785
Other Dutch possessions in Indian Seas	662,500	44,213	732,700	36,430
Dutch East Indies (except other Dutch possessions in Indian Seas)	2,704,800	151,827	634,200	29,671
Other countries in East Indies and Pacific, not elsewhere specified	17,200	939	186,700	8,975
Brazil	116,700	7,083	642,700	34,965
Peru				
South and Central America (except Brazil and Peru)	16,500	790		
West Africa:				
French West Africa	31,900	2,163		
Gold Coast				
Other parts of West Africa	68,200	3,548	7,100	384
East Africa, including Madagascar			6,700	170
Other countries	101,800	5,476	144,500	7,301
Totals	17,407,100	£982,092	11,966,800	£565,851
Gutta percha and balata	1,397,700	282,646	1,588,200	264,744
Reclaimed and waste rubber	67,600	1,796	12,500	201
Rubber substitutes	19,700	566		
Totals, unmanufactured	18,892,100	£1,267,100	13,567,500	£830,796
MANUFACTURED				
Boots and shoes, dozen pairs	6,131	£29,166	3,225	£11,253
Waterproof clothing		1,250		4,364
Insulated wire		4,137		2,745
Tires and tubes		419,093		331,174
Other rubber manufactures		74,356		59,017
Totals, manufactured		£528,002		£210,553
Exports				
UNMANUFACTURED				
Waste and reclaimed rubber	520,800	£14,154	642,000	£8,021
Rubber substitutes	47,000	3,151	98,500	1,884
Totals, unmanufactured	567,800	£17,305	740,500	£9,905
MANUFACTURED				
Boots and shoes, dozen pairs	12,979	£27,329	9,470	£21,031
Waterproof clothing		137,437		56,848
Insulated wire		166,072		61,611
Submarine cables		326,295		83,339
Tires and tubes		417,639		140,656
Other rubber manufactures		330,669		197,465
Totals, manufactured		£1,405,441		£560,950
Exports—Colonial and Foreign				
UNMANUFACTURED				
Crude rubber				
To Russia	11,400	£856		
Sweden, Norway and Denmark	385,400	23,020	110,800	£4,736
Germany	1,011,800	54,351	1,323,500	50,946
Belgium	196,700	12,378	102,200	4,097
France	719,800	44,097	2,655,300	113,993
Spain	53,900	3,539	22,400	1,132
Italy	270,900	20,169	125,200	6,628
Austria	22,400	1,190	34,000	2,000
Hungary				
Other European countries	267,000	15,800	221,400	9,244
United States	78,500	9,573	5,559,400	221,649
Canada	248,000	16,645	4,900	220
Other countries	22,300	1,280		
Totals	3,288,100	£202,898	10,159,100	£414,645
Waste and reclaimed rubber				
Gutta percha and balata	32,300	£6,396	40,400	£6,114
Rubber substitutes				
Totals, unmanufactured	3,320,400	£209,294	10,199,500	£420,759
MANUFACTURED				
Boots and shoes, dozen pairs	1,169	£4,412	416	£1,364
Waterproof clothing		296		
Insulated wire				
Tires and tubes		82,192		43,606
Other rubber manufactures		2,785		3,072
Totals, manufactured		£89,385		£48,042

United Kingdom Rubber Statistics

	Imports			
	Year ended December 31			
	1920	1921	1920	1921
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude rubber				
From—				
Straits Settlements	56,516,400	£6,499,413	50,683,700	£2,437,942
Federated Malay States	67,151,200	6,860,824	58,069,000	2,872,887
British India	12,286,800	1,308,035	8,659,900	438,415
Ceylon and dependencies	47,982,900	4,657,041	33,114,200	1,586,598
Other Dutch possessions in Indian Seas	8,608,600	870,634	11,618,800	552,799
Dutch East Indies (except other Dutch possessions in Indian Seas)	17,769,400	1,667,780	19,275,600	943,799
Other countries in East Indies and Pacific not elsewhere specified	2,607,600	263,840	2,581,600	124,148
Brazil	18,354,400	1,793,766	4,684,400	208,385
Peru	216,700	20,261	166,400	8,345
South and Central America (except Brazil and Peru)	386,900	36,482	165,000	7,984
West Africa:				
French West Africa	601,800	53,085	36,600	1,311
Gold Coast	231,100	22,239	77,306	4,105
Other parts of West Africa	1,210,100	104,379	239,600	11,095
East Africa (including Madagascar)	1,366,900	122,781	327,400	13,585
Other countries	2,900,200	237,161	674,100	30,943
Totals	248,191,000	£24,517,721	190,375,600	£9,242,336
Waste and reclaimed rubber	8,401,700	165,905	892,600	14,391
Gutta percha and balata	10,190,000	1,999,058	7,040,900	1,237,256
Rubber substitutes	1,026,900	47,722	130,700	3,856
Totals, unmanufactured	267,809,600	£26,730,406	198,439,800	£10,497,839
MANUFACTURED				
Boots and shoes, dozen pairs	280,481	£714,685	62,610	£158,985
Waterproof clothing		13,174		14,772
Insulated wire		33,054		43,142
Submarine cables		50		
Tires and tubes		5,577,061		4,086,078
Other rubber manufactures		810,807		674,674
Totals, manufactured		£7,148,831		£4,977,651
Exports				
UNMANUFACTURED				
Waste and reclaimed rubber	152,475	£397,763	48,894	£104,096
Rubber substitutes	28,703	123,346	5,973	16,244
Totals, unmanufactured	181,178	£521,109	54,867	£120,340
MANUFACTURED				
Boots and shoes, dozen pairs	167,300	£358,727	104,623	£229,357
Waterproof clothing		2,927,176		951,788
Insulated wire		1,753,449		1,236,362
Submarine cables		1,776,940		2,147,250
Tires and tubes		6,471,025		2,064,401
Other rubber manufactures		4,690,503		2,368,629
Totals, manufactured		£17,977,820		£8,997,787
Exports—Colonial and Foreign				
UNMANUFACTURED				
Crude rubber				
To Russia	139,800	£16,295	368,800	£12,668
Sweden, Norway and Denmark	2,906,200	270,965	1,712,700	88,689
Germany	11,532,500	996,076	16,496,100	592,231
Belgium	4,845,100	546,455	2,557,700	103,181
France	26,701,000	3,034,798	18,074,200	747,630
Spain	517,400	54,147	378,800	18,378
Italy	6,024,800	692,953	2,919,900	119,324
Austria-Hungary	379,700	35,731	1,315,100	62,649
Other European countries	2,420,100	214,797	5,851,200	199,858
United States	55,661,100	6,890,203	45,930,900	1,998,700
Canada	7,270,100	825,124	308,000	12,864
Other countries	2,461,700	289,279	122,500	6,973
Totals	120,859,500	£13,866,823	96,035,900	£3,963,145
Waste and reclaimed rubber	13,817	£5,596	6,116	£991
Gutta percha and balata	1,526	235,394	399	101,338
Totals, unmanufactured	120,874,843	£1,627,813	96,042,415	£4,065,474
MANUFACTURED				
Boots and shoes, dozen pairs	6,757	£34,970	3,725	£13,282
Waterproof clothing		669		752
Tires and tubes		481,808		448,362
Other manufactures		42,759		32,064
Totals, manufactured		£560,206		£494,460

The Market for Rubber Scrap

New York

The rubber scrap market for the last month continued dull. There has been very little buying on the part of reclaimers, due to substitution of low-priced crude rubber for reclaims. Freight rates are prohibitive at present prices for scrap except within short distances from customer's mill.

The trade is encouraged by Akron reports of good tire manufacturing conditions predicted for that section and the tire trade generally for the coming season.

BOOTS AND SHOES. Prices have fallen off. There has been no consuming demand. No large orders have been taken, consequently the movement of stocks has been limited to very small shipments.

MIXED TIRES. These experienced a drop of 10 cents a hundred pounds the last of January and trade has been reduced to very small proportions.

INNER TUBES. Bid prices were slightly firmer a month ago and there has been more activity in the New York market. Purchases for export were in evidence about the second week of February. Trade for domestic consumption is very slow.

MECHANICALS continue to be without interest or value as for a long time past.

The export movement of rubber scrap for the calendar years 1919, 1920 and 1921 are compared in the following approximate figures:—

	POUNDS	VALUE
1919.....	8,292,000	\$808,990
1920.....	10,468,500	788,100
1921.....	7,838,500	423,970

Quotations for Carload Lots Delivered

February 21, 1922

Prices subject to change without notice

Boots and Shoes

Boots and shoes.....	lb.	\$0.03¼ @	.03½
Trimmed arctics.....	lb.	.02¼ @	
Untrimmed arctics.....	lb.	.01¼ @	

Hard Rubber

Battery jars, black compound.....	lb.	*07½ @	
No. 1, bright fracture.....	lb.	*.12 @	.15

Inner Tubes

No. 1.....	lb.	.04¼ @	
Compounded.....	lb.	.03¼ @	
Red.....	lb.	.03 @	

Mechanicals

Black scrap, mixed, No. 1.....	lb.	*.02¼ @	.03
No. 2.....	lb.	*.01½ @	.02
Heels.....	lb.	*.02¼ @	.03
Horse-shoe pads.....	lb.	*.02¼ @	.03
Hose, air brake.....	lb.	*.01 @	.01½
fire, cotton lined.....	lb.	*.01 @	
garden.....	lb.	.07 @	
Matting.....	lb.	*.01 @	
Red packing.....	lb.	*.04¼ @	.05
Red scrap, No. 1.....	lb.	*.07 @	.08
No. 2.....	lb.	*.05¼ @	.06
White scrap, No. 1.....	lb.	*.07 @	.07½
No. 2.....	lb.	.06 @	.06½

Tires

Pneumatic—

Auto peelings.....	lb.	.01½ @	
Bicycle.....	lb.	.01 @	.01¼
Standard white auto.....	lb.	*02¼ @	.02¾
Mixed auto.....	lb.	.00¾ @	.01
Stripped, unguaranteed.....	lb.	*.01 @	.01½
White, G. & G., M. & W., and U. S.....	lb.	*.02¼ @	

Solid—

Carriage.....	lb.	*.02¼ @	.02¾
Iron y.....	lb.	@	
Truck, clean.....	lb.	*.01½ @	.02

*Nominal.

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. The decline noted in spot prices last month reached 16.50 cents a pound before the upward reaction took place on February 1. Since that date, to the 21st of the past month, the price has made a net advance of 130 points, to 18.75 experiencing in its upward course two notable setbacks. The first of these was of three days' duration ending on the 8th and the second occurred on the 17th of February. The upward turn at the first of the month was led by a sharp upturn in Liverpool based on increased demand abroad.

The present rate of domestic consumption for the year, including linters is placed at about 6,600,000 bales and exports at about 7,100,000 bales, a total of 13,700,000 bales for the season. It is estimated that there will be a reduction of about 4,000,000 bales in the amount carried forward in America at the end of the season.

EGYPTIAN COTTON. Egyptian prices have declined from a month ago about 4 cents on Sakellarides and upper Egyptians. Medium grade Sakellarides is now worth about 32 cents ex duty, and medium grade uppers 25 cents. Sakellarides is in good supply except for the extra grades, while the amount of upper Egyptian cotton still available from the recent crop, continues to be an unknown quantity. A month or more ago it was thought that very little desirable uppers were available, but recent advices from Alexandria indicate that a fair quantity of this staple is still held up-country in Egypt for higher prices.

The acreage restriction put in force last season is still holding, and, according to government regulations, not more than one-third of the cultivable area can be sown to cotton. Therefore, unless there is an unusually fine growing season, the crop in prospect will be well below pre-war average.

ARIZONA COTTON. This grade has declined somewhat in sympathy with Egyptians. Nevertheless, prices are firm. No knowledge is yet available as to this year's acreage but reports from Phoenix indicate that it will be slightly larger than last year. Medium Pima is quoted at 35 cents.

SEA ISLAND COTTON. Sea Islands are firm at around 40 cents for average extra choice. Advices from Savannah indicate that there will probably be an increase in the acreage devoted to this cotton during the coming season, and that a crop of 10,000 to 12,000 bales may be raised provided growing conditions are at least normal.

RAINCOAT CLOTHS. Even at the new market the business in raincoat cloths is very much depressed. There probably never has been a time in the history of the raincoat business in New York when so few goods were being consumed as at present. Out of town a few concerns are selling specialties but aside from these, the others are not doing 25 per cent of their normal business. This condition will doubtless change with the advent of spring rains. Retailers will not buy raincoats today unless their stocks are depleted, because they do not regard a raincoat as an absolute necessity.

SHEETINGS. There has been improved buying during recent weeks and more optimism has been shown by both buyer and seller. The market is somewhat firmer.

TIRE FABRICS. There is very little call on the part of tire manufacturers for prompt shipment of tire fabrics. The influence of raw cotton prices and the possibility of the enactment of a tariff of 20 cents a pound on all Egyptian cotton longer than 1½ inch staple has unsettled both buyer and seller.

Owing to strikes and the prevailing uncertainties of prices, quotations on many fabrics in the following list are unobtainable:

New York Quotations

February 21, 1922

Prices subject to change without notice

Burlaps

36--8-ounce	.....	\$3.90	@	\$3.95
40--7-ounce	.....	3.80	@	3.85
40--7½-ounce	.....	4.00	@	4.05
40--8-ounce	.....	4.05	@	4.10
40--10-ounce	.....	4.95	@	5.00
40--10½-ounce	.....	5.00	@	5.05

Drills

38-inch 2.00-yard	.....yard	.16½	@	
40-inch 3.47-yard	.....	.10¾	@	
52-inch 1.90-yard	.....	.18½	@	
60-inch 1.52-yard	.....	.22¾	@	

Duck

Carriage Cloth				
38-inch 2.00-yard enameling duck	.....yard	.17½	@	
40-inch 1.47-yard	.....	.23½	@	
72-inch 16.66-ounce	.....	.40½	@	
72-inch 17.21-ounce	.....	.41½	@	

Mechanical

Hose	.....pound	.32	@	
Belting	.....	.31	@	

Hollands, 40-inch

Acme	.....yard	@		
Endurance	.....	@	
Penn	.....	@	

TIRE FABRICS

JENCKES SPINNING COMPANY

PAWTUCKET RHODE ISLAND

AKRON OFFICE
Second National Building

NEW YORK OFFICE
Fisk Building,
Broadway at 57th Street

Dead Finish

Piece	.....	@	
Cut	.....	@	
Standard, 36-inch, white	.....	@	
36-inch, colors	.....	@	
42-inch, white	.....	@	
42-inch, colors	.....	@	

Flat Finish

Piece	.....	@	
Cut	.....	@	
Imperial, 36-inch, white	.....	@	
36-inch, colors	.....	@	
42-inch, white	.....	@	
42-inch, colors	.....	@	

Lonsdale

White, piece	.....	@	
cut	.....	@	
Colors, piece	.....	@	
cut	.....	@	
Green and blue, piece	.....	@	
cut	.....	@	

Nainsooks

White	.....	@	
Flesh	.....	@	

Raincoat Fabrics

Cotton

Bombazine 64 x 60	.....yard	\$0.11¼	@	
60 x 48	.....	.10¾	@	
Cashmeres, cotton and wool, 36-inch, tan	.....	.55	@	
Twills 64 x 72	.....	@	
60 x 102	.....	@	
Twill, mercerized, 36-inch, blue and black	.....	@	
tan and olive	.....	@	
Tweed	.....	.20	@	1.00
printed	.....	.15	@	
Plaids 60 x 48	.....	.11¼	@	
56 x 44	.....	.10¾	@	
Repp	.....	@	
Prints 60 x 48	.....	.12	@	
64 x 60	.....	.13	@	

Sheetings, 40-inch

48 x 48, 2.50-yard	.....yard	.13	@	
48 x 48, 2.85-yard	.....	.11	@	
64 x 68, 3.15-yard	.....	.12½	@	
56 x 60, 3.60-yard	.....	.10½	@	
48 x 44, 3.75-yard	.....	.09	@	

Silks

Canton, 38-inch	.....yard	.29½	@	
Schappe, 36-inch	.....	.45	@	

Stockinettes

Single Thread

3¼ Peeler, carded	.....pound	@		
4¼ Peeler, carded	.....	@	
6¼ Peeler, combed	.....	@	

Double Thread

Zero Peeler, carded	.....pound	@		
3¼ Peeler, carded	.....	@	
6¼ Peeler, combed	.....	@	

Tire Fabrics

Building

17¼-ounce Sakellarides, combed	.....pound	.80	@	.95
17¼-ounce Egyptian, combed	.....	.72	@	.78
17¼-ounce Egyptian, carded	.....	.68	@	.73
17¼-ounce Peeler, combed75	@	.78
17¼-ounce Peeler, carded50	@	.55

Cord

15-ounce Egyptianpound	.75	@	.83
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Bicycle

8-ounce Americanpound	@		
10-ounce American	@		

Chafar

9¼-ounce Sea Islandpound	@		
9¼-ounce Egyptian, carded	.....	.83	@	
9¼-ounce Peeler, carded	.....	.65	@	

THE FIRM INDUSTRIA BRAZILEIRA DE BORRACHA BERROGIAN, Limitada, is now in possession of the Companhia Brasileira de Artefactos de Borracha, Rio de Janeiro. The capital of this firm has been increased to 6,000,000 milreis. The banking connections include among other firms the Deutsche Bank, Deutsch-Übersuiche Bank, Die Brasilianische Bank für Deutschland, and the Deutsch-Südamerikanische Bank, all in Berlin.

The Market for Chemicals and Compounding Ingredients

New York

The continued steady increase in manufactured rubber goods output, particularly in automobile tires and tubes is reflected in the movement of compounding ingredients. Supplies in manufacturers' hands are generally believed to be moderate and the increasing demand for goods for spring trade will benefit dealers in supplies together with the manufacturers.

Makers of lithopone turned the year with small stocks on hand and are operating their plants to capacity. Oxide of zinc producers also are experiencing an active demand for this time of the year from the tire trade.

ANILINE. Stocks are large, prices soft and trade dull. These conditions have prevailed throughout the month.

ANTIMONY SULPHIDES. Business has been extremely quiet. Grades of golden sulphide have been at 18 cents without influencing demand on the part of rubber manufacturers. Possibly interest will revive as the season for inner tubes advances.

BARYTES. Imports of foreign barytes are increasing but are not destined to affect domestic business this year. Reduction in price of the domestic product has stimulated demand and steady improvement is noted.

BENZOL. The supply is good, prices firm and business brisk, leaving no accumulation of stock. There is also a very active export trade in progress.

BLANC FIXE. Stocks reported small and trade movement very inactive.

CADMIUM SULPHIDE. Yellow was scarce and high, advancing to \$1.50 to \$1.85 a pound about the middle of February.

CARBON BISULPHIDE. In short supply and quoted early in the month at 6 to 7 cents a pound. Later it advanced one-half cent a pound and the demand became brisk.

CARBON TETRACHLORIDE. Quotations receded early in the month by one cent a pound without stimulating buying interest.

CHINA CLAY. Spot stocks are not large. There seems to be a good well-sustained call for both foreign and domestic grades.

DRY COLORS. Business in dry colors generally has been quiet, with a demand slowly increasing in volume at steady prices.

GAS BLACK. The movement of gas black has been good for the season and is developing strongly on the part of the tire-producing trade, the needs of which will doubtless steadily increase with the advance of the tire season.

LITHARGE. Slow improvement is noted, which has not advanced beyond routine demand. The production of boots and shoes and mechanical goods requires a considerable tonnage of litharge and sublimed lead. The renewal of capacity production in these branches of the rubber industry is a matter of considerable interest to the litharge trade. Fortunately improvement is forecasted in these as in other rubber lines.

LITHOPONE. The volume of lithopone tonnage is large and its production at full capacity is liable to continue throughout the year. The only unsatisfactory condition to the makers is the very low price that obtains for their product. Imports are said to be liberal.

The character of the German lithopone is criticized more adversely than that from Belgium. Foreign competition has not effected any reduction of price on the American product nor curtailed the amount of its output.

SOLVENT NAPHTHA. This material continues in good demand and short supply.

SUBLIMED LEAD. Essentially the same market conditions prevail in the case of sublimed lead as in the case of litharge.

SULPHUR. No changes in price are noted. The call for supplies is on a routine basis.

SULPHUR CHLORIDE. Ample supply quoted at 5 to 6 cents a pound with no interest manifest.

TALC. There has been a good demand for talc in both foreign and domestic grades.

WHITING. The market movement of whiting has shown a steady increase during the month.

ZINC OXIDE. Interest on the part of tire makers began early in February and the demand from that branch of the rubber industry is growing steadily in preparation for the Spring tire campaign.

New York Quotations

February 21, 1922

Prices subject to change without notice

Accelerators, Organic

Accelerene (f. o. b. English port).....	lb.	13.	@
Adco.....	lb.	\$0.75	@
Aldehyde ammonia crystals.....	lb.	.90	@ .95
Aniline (f. o. b. factory).....	lb.	.16 1/2	@ .18
Diphenyl-guanidine.....	lb.	1.50	@
Excellerex.....	lb.	.60	@
Formaldehyde aniline.....	lb.	.45	@ .50
Hexamethylene tetramine.....	lb.	.72 1/2	@ .75
Lead oleate (factory).....	lb.		@
Methylene aniline.....	lb.	.40	@
N. C. C.....	lb.		@
No. 999.....	lb.		@
Paradin.....	lb.	.40	@
Paranitroso dimethylaniline.....	lb.		@
Paraphenylene diamine.....	lb.	1.55	@ 1.65
Speed-X.....	lb.	1.50	@
Super-Sulphur, No. 1.....	lb.	.50	@ .60
No. 2.....	lb.	.25	@ .30
Thiocarbamide.....	lb.	.35	@ .60
Vul Ko Cene.....	lb.	.35	@
X L O.....	lb.	1.50	@

Accelerators, Inorganic

Lead, dry red.....	lb.	.08	@ .08 1/4
sublimed white.....	lb.		@
white, basic carbonate.....	lb.	.06 1/4	@ .07 1/2
Lime, flour, superfine.....	lb.	.02 1/2	@ .03
Litharge, domestic.....	lb.	.08 1/2	@
imported.....	lb.	.17	@
Orange mineral.....	lb.	.11	@ .13
Magnesium, carbonate, light (bags).....	lb.	.05 1/4	@
calcined light (bbls.).....	lb.	.24	@ .27
calcined extra light (bbls.).....	lb.	.45	@
calcined light (bbls.).....	lb.	.20	@
calcined heavy (bbls.).....	lb.	.05 1/4	@ .07 1/4

Acids

Acetic 28 per cent (bbls.).....	cwt.	2.50	@ 3.00
glacial, 99 per cent.....	cwt.	8.50	@ 10.00
Cresylic (97% straw color).....	lb.	.50	@ .52
(95% dark).....	lb.	.45	@ .47
Muriatic, 20 degrees.....	cwt.	1.25	@ 1.50
Nitric, 36 degrees.....	cwt.	5.00	@ 6.00
Sulphuric, 66 degrees.....	cwt.	16.00	@ 17.00

Alkalies

Caustic soda.....	cwt.	3.35	@ 3.75
Soda ash, 58% (bbls.).....	cwt.	1.90	@ 2.00

Colors

Black

Bone, powdered.....	lb.	.05 1/4	@ .07 1/4
Carbon black.....	lb.	.10 1/4	@ .20
Dipped pressed.....	lb.	.13	@
Dipped goods.....	lb.	1.00	@
Drop.....	lb.	.07 1/4	@ .16
Ivory black.....	lb.	.15	@ .45
Lampblack.....	lb.	.17	@ .45
Micronex.....	lb.	.12	@ .17
Oil soluble aniline.....	lb.	.90	@
Rubber maker's black (non-flying).....	lb.	.40	@

Blue

Cobalt.....	lb.	.23	@ .30
Dipped goods.....	lb.	1.00	@
Prussian.....	lb.	.50	@
Rubber makers' blue.....	lb.	3.50	@
Ultramarine.....	lb.	.10	@ .35

Brown

Iron oxide.....	lb.	.04	@ .05
Sienna, Italian, raw and burnt.....	lb.	.05 1/4	@ .07 1/4
Umber, Turkey, raw and burnt.....	lb.	.05 1/4	@ .06 1/4

Green

Chrome, light.....	lb.	.30	@ .32
medium.....	lb.	.35	@ .36
dark.....	lb.	.36	@ .45
commercial.....	lb.	.12	@
tile.....	lb.	.11	@ .13
Guignet.....	lb.	1.50	@
Dipped goods.....	lb.	1.00	@
Oxide of chromium.....	lb.	.45	@ .57
Rubber makers' green.....	lb.	3.50	@

Colors—Continued

Red	
Antimony, crimson	lb. \$0.38 @ \$0.48
crimson, 15/17%, sulphur free	lb. .38 @ .47
crimson, F.	lb. .35 @ .47
crimson, R. M. P.	lb. .48 @ .27
Antimony, golden	lb. .20 @ .27
golden 1.	lb. .20 @ .27
golden 2.	lb. .25 @ .27
golden, 15/17%, sulphur free	lb. .21 @ .27
7-A	lb. .35 @ .27
vermillion	lb. .55 @ .27
red sulphuret	lb. .20 @ .27
Arsenic, red sulphide	lb. .12 @ .27
Cadmium, sulphide	lb. 1.85 @ .27
Dipped goods, red	lb. 1.00 @ .27
purple	lb. 1.00 @ .27
orange	lb. 1.00 @ .27
Indian	lb. .08 @ .12
Indian maroon, English	lb. .13 @ .12
Iron oxide, reduced grades	lb. .03 @ .13
pure bright	lb. .14 @ .13
Maroon oxide	lb. .08 @ .12
Red oxide, crimson	lb. .05 @ .12
English	lb. .15 @ .12
Spanish	lb. .04 @ .12
Oil soluble aniline, red	lb. 1.70 @ 1.95
orange	lb. 1.45 @ .12
Oximony	lb. .16 @ .12
Para toner	lb. 1.40 @ .12
Rubber makers' red (four shades)	lb. 3.50 @ .12
purple	lb. 2.50 @ .04 1/2
Spanish natural	lb. .03 1/2 @ 2.75
Toluidine toner	lb. 2.50 @ 2.75
Venetian	lb. .03 1/2 @ .06 1/2
Vermilion, American	lb. .25 @ .30
English quickdye	lb. .85 @ .90
White	
Albalith	lb. .06 @ .06 1/2
Aluminum bronze	lb. .06 @ .06 1/2
Lithopone, domestic (factory)	lb. .06 @ .06 1/2
Zinc oxide, American Horse Head (factory):	
Special	lb. .07 1/2 @ .08
XX red	lb. .07 1/2 @ .08
French process, Florence brand (factory):	
White seal	lb. .11 @ .11 1/2
Green seal	lb. .09 1/2 @ .10 1/2
Red seal	lb. .08 1/2 @ .09 1/2
Azo (factory):	
ZZZ (lead free)	lb. .07 1/2 @ .08
ZZ (under 5% lead)	lb. .07 1/2 @ .09 1/2
Z (#10% lead)	lb. .07 @ .07 1/2
Yellow	
Arsenic, yellow sulphide	lb. .18 @ .03
Cadmium, sulphide, light	lb. .17 @ .03
Chrome, light and medium	lb. 1.00 @ .03
Dipped goods	lb. .02 @ .03
Ochre, domestic	lb. .02 @ .03
imported	lb. .02 @ .03
Oil soluble aniline	lb. .02 @ .03
Rubber makers' yellow	lb. .02 @ .03
Compounding Ingredients	
Aluminum flake (carloads)	ton 29.45 @ 30.00
hydrate, light	lb. .20 @ .22
Ammonia carbonate	ton .07 @ .09
Asbestos	ton 20.00 @ 25.00
Barium, carbonate, precipitated	ton 80.00 @ .09
dust	ton 100.00 @ .09
Barytes, pure white (carloads)	ton 23.90 @ .09
off color (carloads)	ton 20.00 @ .09
uniform floated (carloads)	ton 23.90 @ .09
Basofo	lb. .04 1/2 @ .04 1/2
Beta-naphthol	lb. .28 @ .04 1/2
Blanc fixe	lb. .04 @ .04 1/2
Bone ash	lb. .02 @ .04 1/2
Carrara filler (factory)	ton .03 1/2 @ .04 1/2
Chalk, precipitated, extra light (f. o. b. factory)	lb. .02 1/2 @ .03 1/2
heavy (f. o. b. factory)	lb. .02 1/2 @ .03 1/2
China, clay, Dixie	ton 22.00 @ 32.00
Blue Ridge	ton 22.00 @ 32.00
Cotton linters, clean mill run	lb. .04 1/2 @ .04 1/2
Fossil flour (powdered)	ton 60.00 @ .04 1/2
(bolted)	ton 60.00 @ .04 1/2
Glue, high grade	lb. .30 @ .40
medium	lb. .20 @ .26
low grade	lb. .15 @ .18
Graphite, flake	lb. .07 @ .05
amorphous	lb. .05 @ .05
Infusorial earth (powdered)	ton 60.00 @ .05
(bolted)	ton 65.00 @ .05
Liquid rubber	lb. .15 @ .05
Mica, powdered	lb. .15 @ .05
Pumice stone, powdered	lb. .03 @ .05
Rotten stone, powdered (bbls.)	ton .02 1/2 @ .04 1/2
Silica, aluminum	ton 20.00 @ 22.50
gold bond	ton .02 @ .05
silver bond	ton .02 @ .05
Soap bark, cut	lb. .08 1/2 @ .09
Soapstone, powdered-gray (carloads)	ton 12.00 @ .242
Starch, powdered corn (bags)	cwt. 2.32 @ 2.42
(bbls.)	cwt. 2.60 @ 2.70

Talc, soapstone	ton \$25.00 @
Terra blanche	ton 22.00 @ 25.00
Tripoli flour, air-floated, cream or rose (factory)	ton 30.00 @ 32.50
white (factory)	ton 32.50 @ 33.50
Tyre-lith	ton 85.00 @
Whiting, Alba	cwt. 1.00 @ 1.15
commercial (factory)	cwt. 1.00 @
Danish	ton 1.75 @ 2.00
English cliffstone (factory)	cwt. 1.20 @ 1.35
gilders	cwt. 1.25 @ 1.45
Paris, white, American (factory)	cwt. 16.00 @ 18.00
Plymouth	ton 30.00 @ 15.00
Quaker	ton 25.00 @
Wood pulp, XXX (f. o. b. factory)	ton 25.00 @
X (f. o. b. factory)	ton 25.00 @

Mineral Rubber

Gilsonite	ton 70.00 @
Genasco (factory)	ton 50.00 @ 52.00
Hard hydrocarbon	ton 33.00 @ 45.00
Soft hydrocarbon	ton 30.00 @ 35.00
320/340 M. P. hydrocarbon	ton 47.50 @ 50.00
300/310 M. P. hydrocarbon	ton 42.50 @ 45.00
Pioneer, M. R. solid (factory)	ton 42.00 @ 44.00
M. R. granular	ton 52.00 @ 54.00
Robertson, M. R. (factory)	ton 35.00 @ 75.00
Rubrax (factory)	ton 50.00 @
States "A"	ton 45.00 @
No. 1	ton 40.00 @
Synpro, granulated, M. R. (factory)	ton 59.50 @ 64.50

Oils

Avoilas compound	lb. .15 @
Castor, No. 1, U. S. P.	lb. .11 1/2 @
No. 3, U. S. P.	lb. .11 @
Corn	lb. .10 1/2 @
Cotton	lb. .11 1/2 @
Glycerine (98 per cent)	lb. .16 1/2 @ .17
Halowax (1,000 lb. steel drums, returnable)	gal. .85 @
Linseed, raw, domestic	lb. .07 1/2 @ .08
Palm lags	lb. .09 @
Palm, niger	lb. .10 @
Peanut	lb. .05 @ .08
Petrolatum, standard	lb. .08 @ .10
Petrolatum, sticky	lb. .12 1/2 @
Pine, steam distilled	lb. .13 1/2 @
Rapeseed, refined	lb. .13 1/2 @
hlow	gal. .37 @ .53
Rosin	gal. .38 @ .60
Synpro	gal. .09 @ .09 1/2
Soya bean	gal. .26 @ .50
Tar	gal. .26 @ .50

Resins and Pitches

Cumar resin, hard	lb. .09 @ .12
soft	lb. .09 @ .12
Tar, retort	bbl. 10.00 @
pitch	bbl. 10.00 @
Burgundy	lb. .05 @
coal tar	lb. .01 1/2 @
pine tar	lb. .03 1/2 @
ponto	lb. .08 @
Rosin, K (bbl.)	280 lbs. 5.80 @
strained (bbls.)	280 lbs. @
Shellac, fine orange	lb. *.80 @

Solvents

Acetone (98.99 per cent drums [6.62 lbs. per gal.])	lb. .12 1/2 @ .13 1/2
Benzol (90%, drums [7.21 lbs. per gal.])	gal. .27 @ .32
pure (drums)	gal. .29 @ .40
Carbon bisulphide (drums [10.81 lbs. per gal.])	lb. .06 1/2 @ .07 1/2
tetrachloride (drums [13.28 lbs. per gal.])	lb. .10 1/2 @ .13
Paracymene (factory)	lb. .15 @
Motor gasoline (steel bbls.)	gal. .24 @
Naphtha, V. M. & P. (steel bbls.)	gal. .23 @
solvent (drums extra)	gal. .28 @
Toluol, pure (7.21 lbs. per gal.)	gal. .90 @ .35
Turpentine, spirits	gal. .30 @
wood	gal. .78 @ .80
Xylol, pure	gal. .45 @ .51
commercial	gal. .31 @ .38

Substitutes

Black	lb. .07 @ .13 1/2
Brown	lb. .10 @ .14
White	lb. .08 @ .13 1/2
Brown factice	lb. .08 @ .15
White factice	lb. .09 @ .15 1/2

Vulcanizing Ingredients

Lead, black hyposulphite (black hypo)	lb. .35 @ .42
Sulphur chloride	lb. .05 @ .06
Sulphur, Bergenport brand, 100% pure (bbls.)	2.55 @ 3.15
(bags)	cwt. 2.30 @ 2.90
Sulphur flour, rubber 100% pure (bbls.)	2.60 @ 3.15
(bags)	cwt. 2.35 @ 2.90
Superfine 99 1/2% pure (bbls.)	2.40 @ 2.90
(bags)	cwt. 2.00 @ 2.50

(See also Colors—Antimony).

Waxes

Wax, beeswax, white, commercial.....	lb.	\$0.45	@	
carnauba, white.....	lb.	.12	@	
carnauba.....	lb.	.16	@	
montan.....	lb.	.05	@	
ozokerite, black.....	lb.	.18	@	
green.....	lb.	.26	@	
paraffine.....	lb.	.25	@	
sweet wax.....	lb.	.10	@	.12

*Nominal.

Motor and Accessory Manufacturers' Association Announces Appointments for 1922

As a result of recent elections the following officers of the Motor and Accessory Manufacturers' Association were reelected for 1922:

E. H. Broadwell, president, vice-president of The Fisk Rubber Co., Chicopee Falls, Massachusetts; W. O. Rutherford, first vice-president, vice-president of The B. F. Goodrich Rubber Co., Akron, Ohio; A. W. Copland, second vice-president, president of Detroit Gear and Machine Co., Detroit, Michigan; H. L. Horning, third vice-president, secretary and general manager of Waukesha Motor Co., Waukesha, Wisconsin; L. M. Wainwright, treasurer, president of Diamond Chain & Manufacturing Co., Indianapolis, Indiana; G. Brewer Griffin, secretary and assistant treasurer, Westinghouse Electric & Manufacturing Co., Springfield, Massachusetts.

The first four directors mentioned in the following list were also reelected, the entire board of directors now being: E. P. Hammond, president, Gemmer Manufacturing Co., Detroit, Michigan; C. E. Thompson, president, Steel Products Co., Cleveland, Ohio; A. W. Copland, president, Detroit Gear & Machine Co., Detroit, Michigan; G. W. Yeoman, vice-president and treasurer, Continental Motors Corporation, Detroit, Michigan; C. H. Flinterman, vice-president, Detroit Pressed Steel Co., Detroit, Michigan; F. Glover, vice-president and general manager, Timken-Detroit Axle Co., Detroit, Michigan; and J. M. McComb, vice-president, Crucible Steel Co. of America, New York, N. Y.

E. H. Broadwell, president, also announced the following committee appointments for the year 1922:

Executive Committee

E. H. Broadwell, chairman, The Fisk Rubber Co., Chicopee Falls, Massachusetts; C. E. Thompson, Steel Products Co., Cleveland, Ohio; W. O. Rutherford, The B. F. Goodrich Co., Akron, Ohio; G. Brewer Griffin, Westinghouse Electric & Manufacturing Co., Springfield, Massachusetts; C. H. L. Flintermann, Detroit Pressed Steel Co., Detroit, Michigan.

Finance Committee

E. H. Broadwell, chairman, The Fisk Rubber Co., Chicopee Falls, Massachusetts; C. E. Thompson, Steel Products Co., Cleveland, Ohio; E. P. Hammond, Gemmer Manufacturing Co., Detroit, Michigan; W. O. Rutherford, The B. F. Goodrich Co., Akron, Ohio; G. Brewer Griffin, Westinghouse Electric & Manufacturing Co., Springfield, Massachusetts; A. W. Copland, Detroit Gear & Machine Co., Detroit, Michigan; J. M. McComb, Crucible Steel Co. of America, Pittsburgh, Pennsylvania.

Membership Committee

A. W. Copland, chairman, Detroit Gear & Machine Co., Detroit, Michigan; G. W. Yeoman, Continental Motors Corporation, Detroit, Michigan; Fred Glover, Timken-Detroit Axle Co., Detroit, Michigan.

Banquet Committee

H. L. Horning, chairman, Waukesha Motor Co., Waukesha, Wisconsin; E. P. Hammond, Gemmer Manufacturing Co., Detroit, Michigan; W. O. Rutherford, The B. F. Goodrich Co., Akron, Ohio.

Committee on Association Relations

G. Brewer Griffin, chairman, Westinghouse Electric & Manufacturing Co., Springfield, Massachusetts; A. W. Copland, Detroit Gear & Machine Co., Detroit, Michigan; M. L. Heminway, Motor & Accessory Manufacturers' Association, New York, N. Y.

Show and Allotment Committee

W. O. Rutherford, chairman, The B. F. Goodrich Rubber Co., Akron, Ohio; G. Brewer Griffin, Westinghouse Electric & Manufacturing Co., Springfield, Massachusetts; C. H. L. Flintermann, Detroit Pressed Steel Co., Detroit, Michigan.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(967) A reader desires the address of the concern manufacturing the patent sliding fastener used on bathing-suit bags, bathing shoes, tobacco pouches, etc.

(968) A Dutch concern desires to represent American manufacturers of ladies' dress shields.

(969) Request is made for the address of a manufacturer of rubber pad sacks for trusses.

(970) Inquiry has been received for the addresses of manufacturers of rubber and cement for inner tube patches.

(971) A correspondent desires to know where he can obtain a simple outfit for sifting old tubes after being ground.

(972) A subscriber requests the address of a manufacturer of rubber poker chips.

(973) An inquiry has been received for information concerning rubber-celluloid.

(974) Information is desired concerning means for printing advertising on toy balloons.

(975) A reader desires information concerning a finishing process to prevent stickiness and give smooth appearance to rubber hot-water bags.

(976) Inquiry is made as to "Petrifite" and its uses.

(977) Information is required concerning method and apparatus for refacing rubber aisle strips removed from passenger cars.

Trade Opportunities from Consular Reports

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet and state number.

DISTRICT OFFICES

New York: 734 Customhouse.
Boston: 1801 Customhouse.
Chicago: 504 Federal Building.
St. Louis: 402 Third National Bank Building.
New Orleans: 1020 Hibernia Bank Building.
San Francisco: 307 Customhouse.
Seattle: 848 Henry Building.

COOPERATIVE OFFICES

Cleveland: Chamber of Commerce.
Cincinnati: Chamber of Commerce;
General Freight Agent Southern Railway, 96 Ingalls Building.
Dayton, Ohio: Dayton Chamber of Commerce.
Los Angeles: Chamber of Commerce.
Philadelphia: Chamber of Commerce.
Portland, Oregon: Chamber of Commerce.

(626) Agency on commission desired by firm in India for sale of rubber goods. Quote c. i. f. Karachi or Bombay. Payment through banks, confirmed letter of credit.

(628) Commercial agency, Natal, South Africa, desires exclusive representation for sale of rubber goods, balata belting, etc.

(666) Manufacturer in Belgium desires chicle gum for chewing gum. Quote c. i. f. Antwerp. Cash against documents.

(681) A merchant in India desires to buy fountain and stylo pens from manufacturers; also agency. Quote c. i. f. Madras. Payment against documents.

(728) Firm in Czechoslovakia desires to purchase rubber, etc., for metal pipes. Quote c. i. f. German, French, or Dutch ports.

(763) Importer in Spain would communicate with exporters of rubber combs.

"CRUDE RUBBER AND COMPOUNDING INGREDIENTS" should be in the library of every progressive rubber man.



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